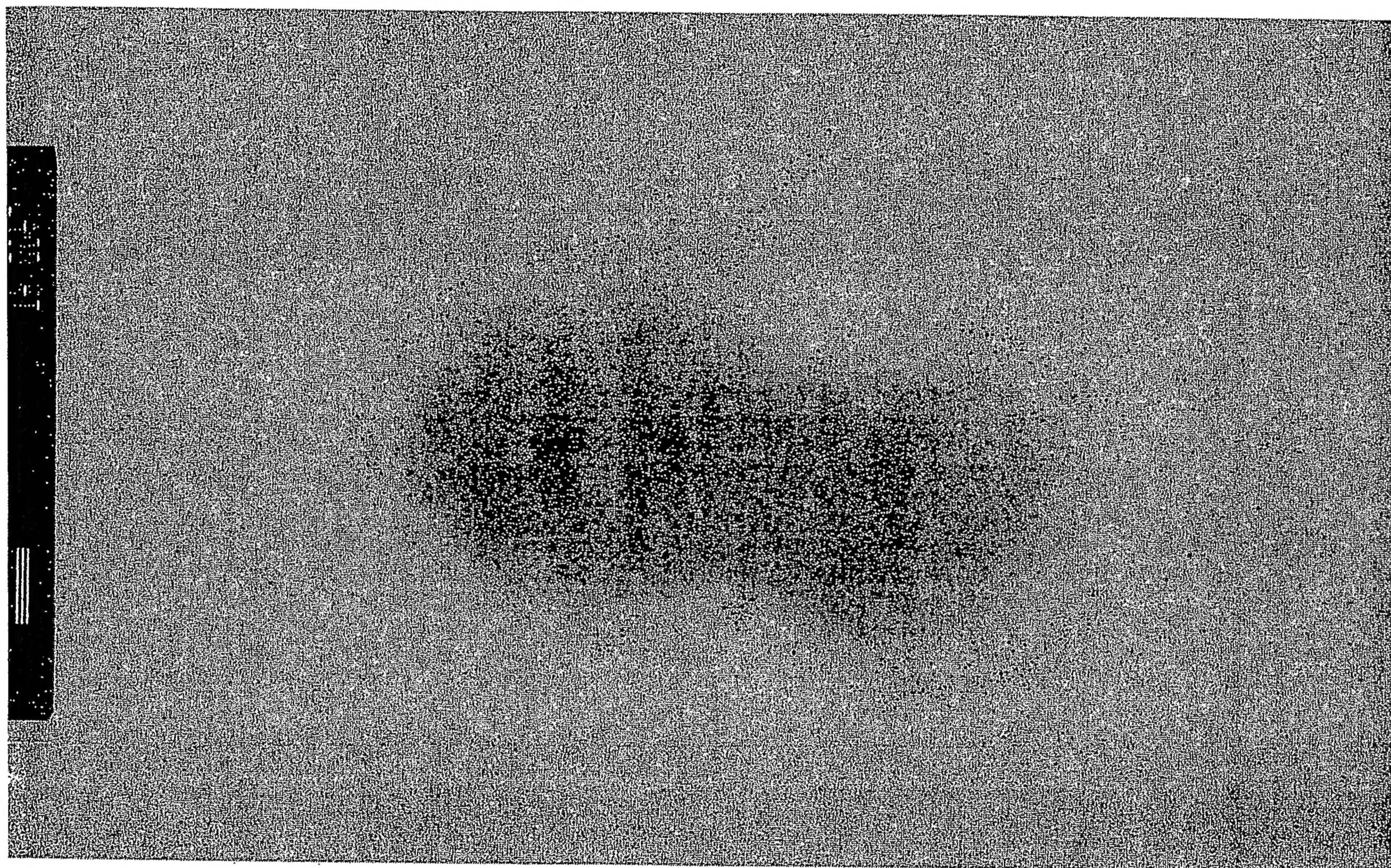


Figure 130



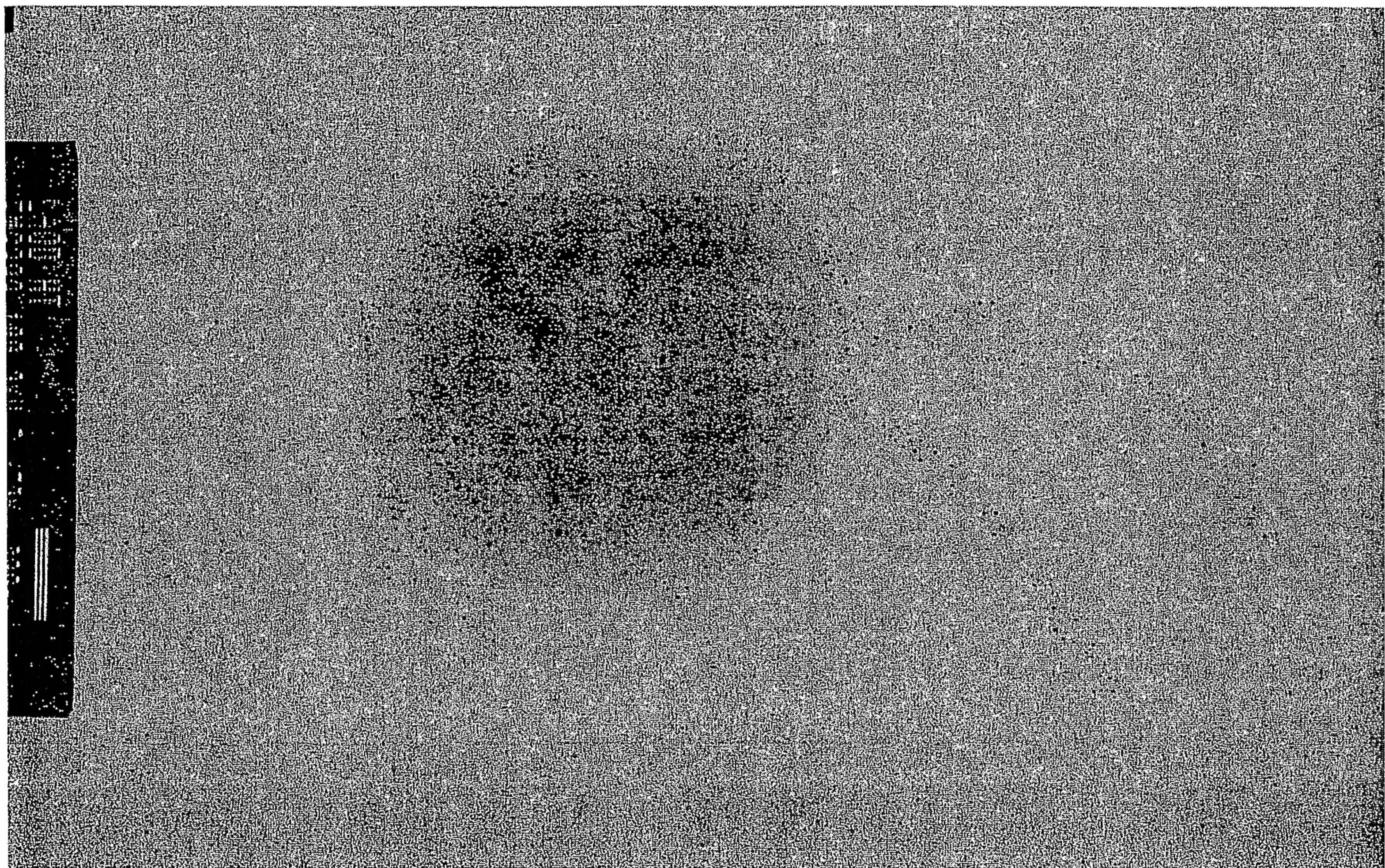
PCT/US05/27239 322/487

Figure 131



323/487

Figure 132



324/487

Figure 133

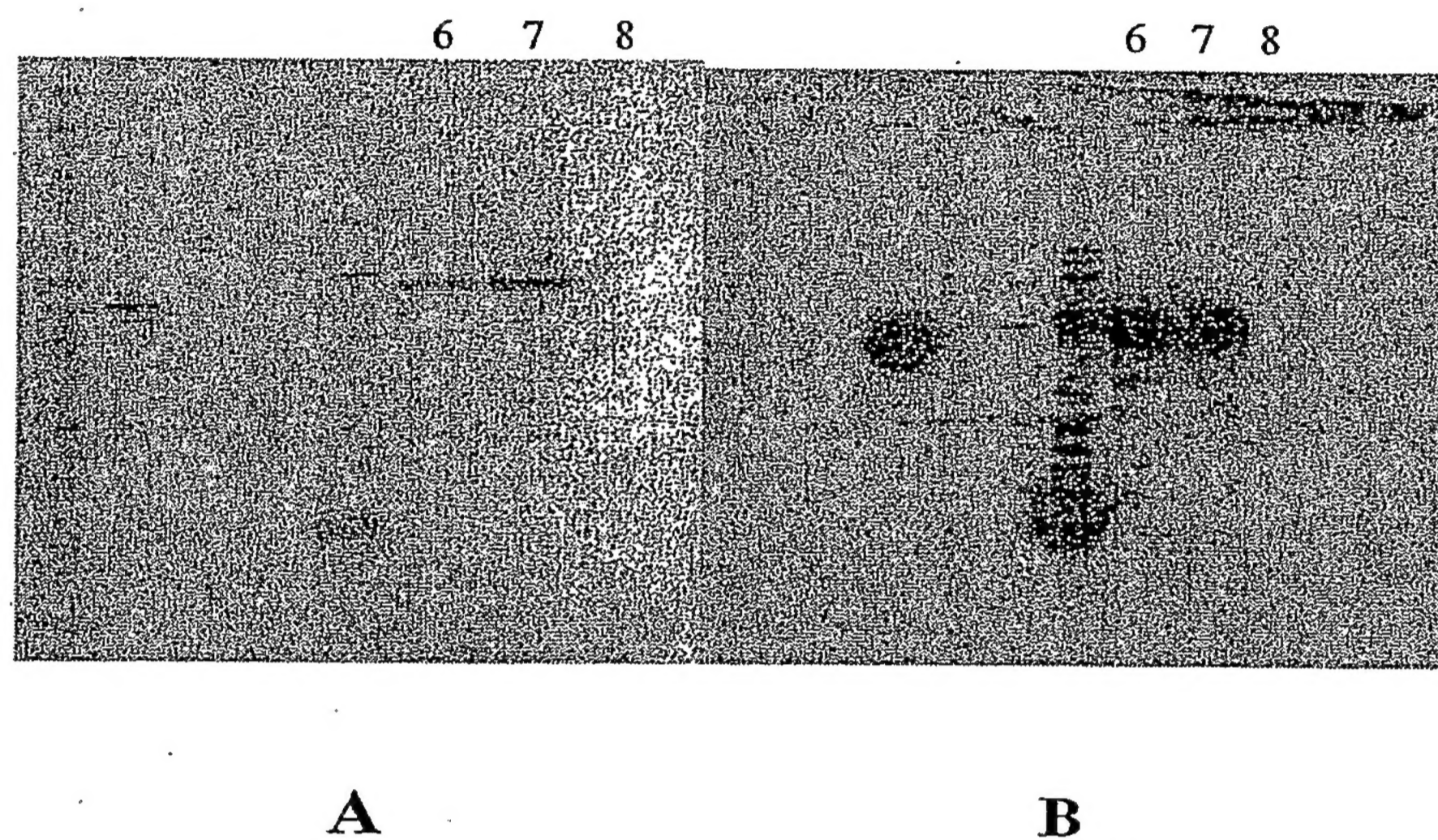
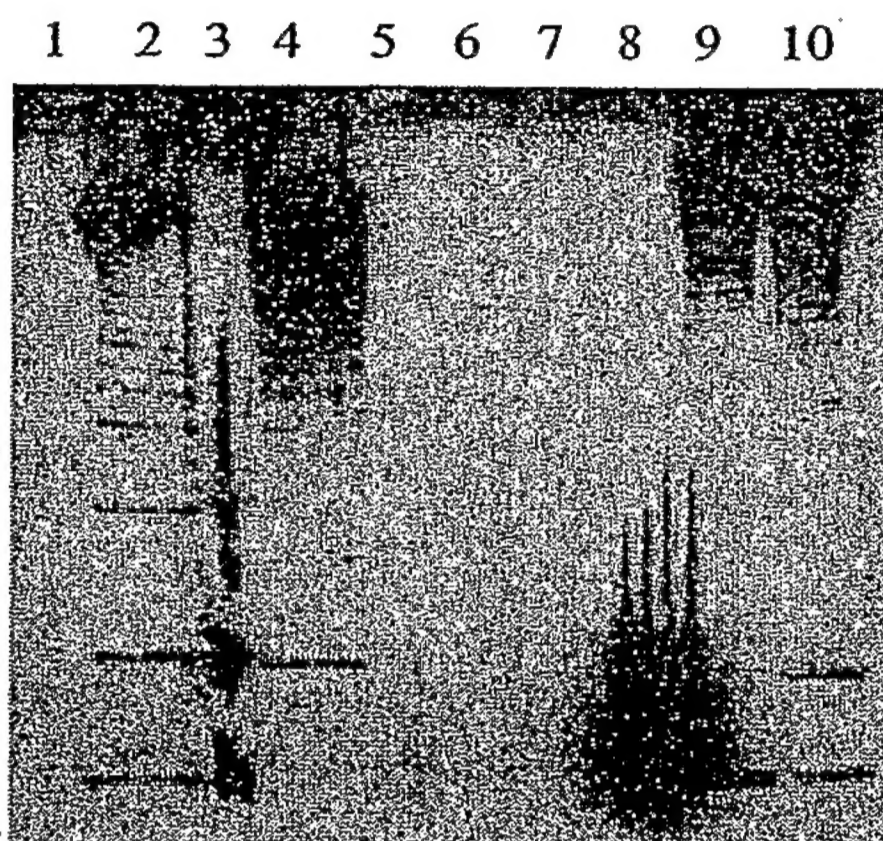
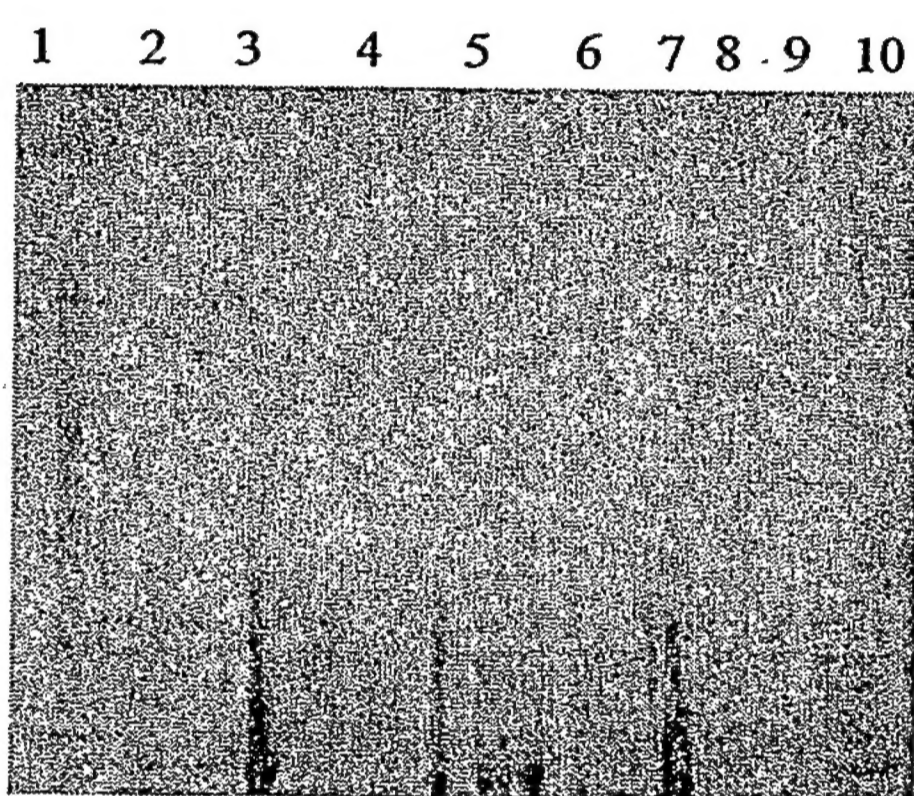


Figure 134



PCT/US05/27239 326/487

Figure 135



Pilus released by *Lactococcus* sonication

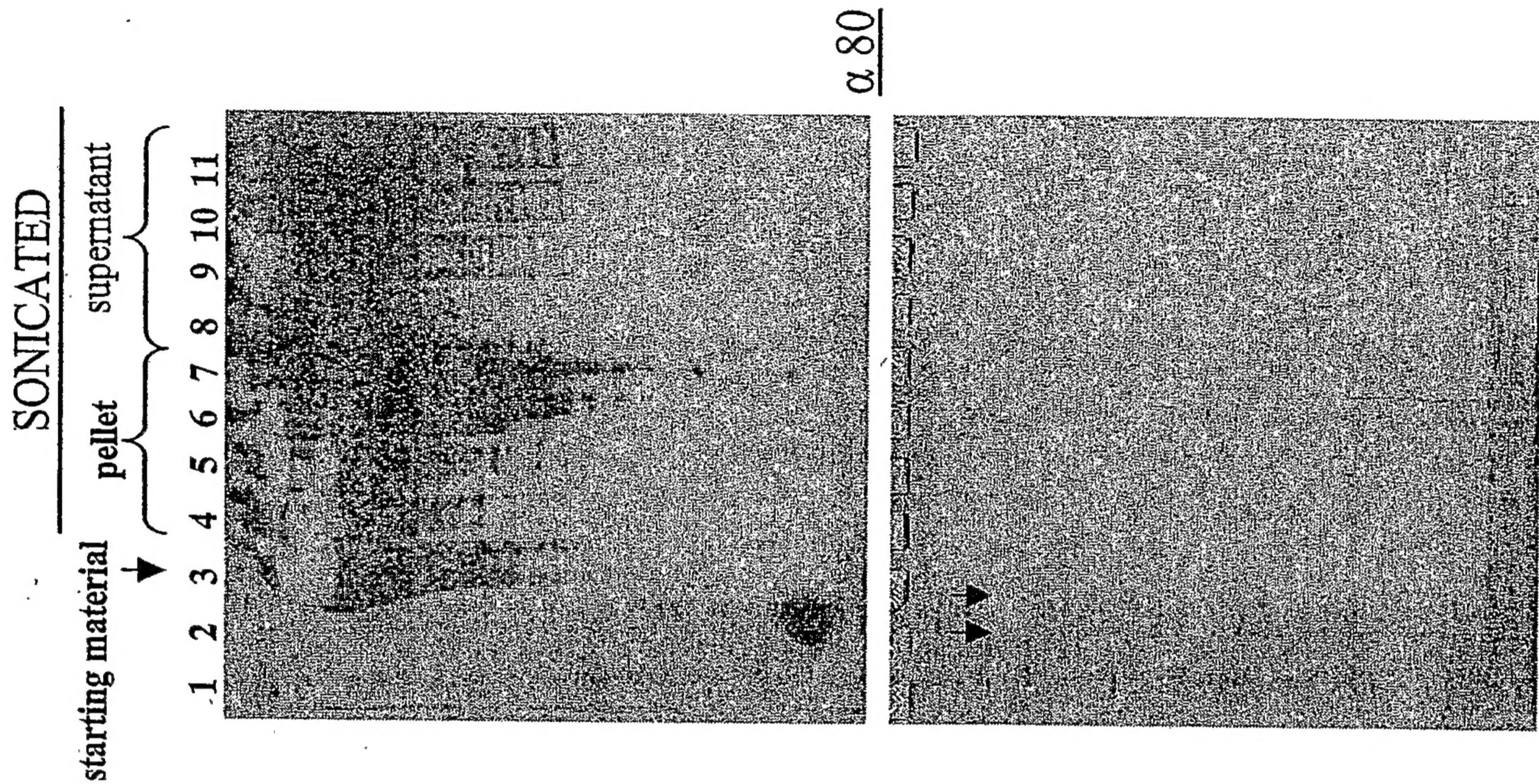


Figure 136A

1. MK
2. GBS 80 (10 ng)
3. L.lactis-AII starting material (30', 0.2 OD)
(not boiled, 0.33 OD)
4. L.lactis-AII (5', 0.33 OD)
5. L.lactis-AII (60' d, 0.33 OD)
6. L.lactis-AII (30', 0.33 OD)
7. L.lactis-AII (not boiled, 2 OD)
8. Supernatant (5', 2 OD)
9. Supernatant (30', 2 OD)
10. Supernatant (60', 2 OD)
11. Supernatant

Figure 136B

1. MK
2. L.lactis-AII
3. L.lactis-AII starting material (30', 0.2 OD)
(not boiled, 0.33 OD)
4. L.lactis-AII (5', 0.33 OD)
5. L.lactis-AII (60' d, 0.33 OD)
6. L.lactis-AII (30', 0.33 OD)
7. L.lactis-AII (not boiled, 2 OD)
8. Supernatant (5', 2 OD)
9. Supernatant (30', 2 OD)
10. Supernatant (60', 2 OD)
11. Supernatant

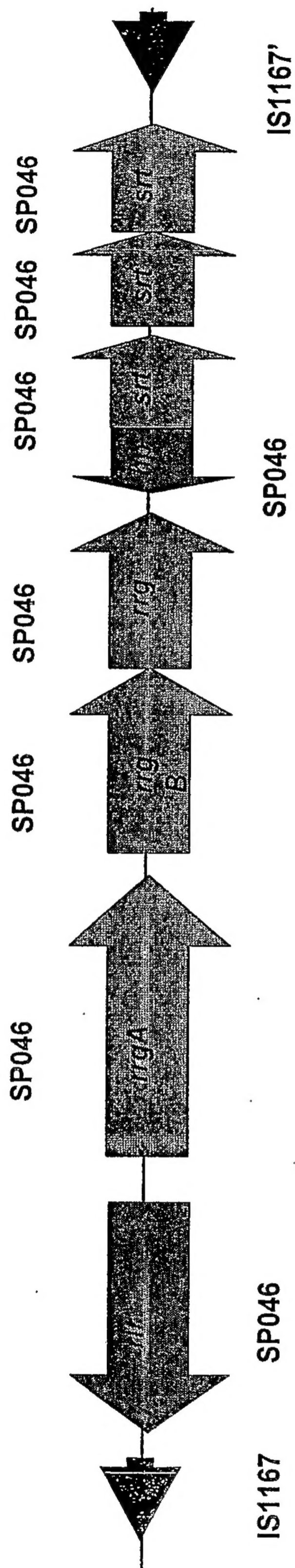


Figure 137

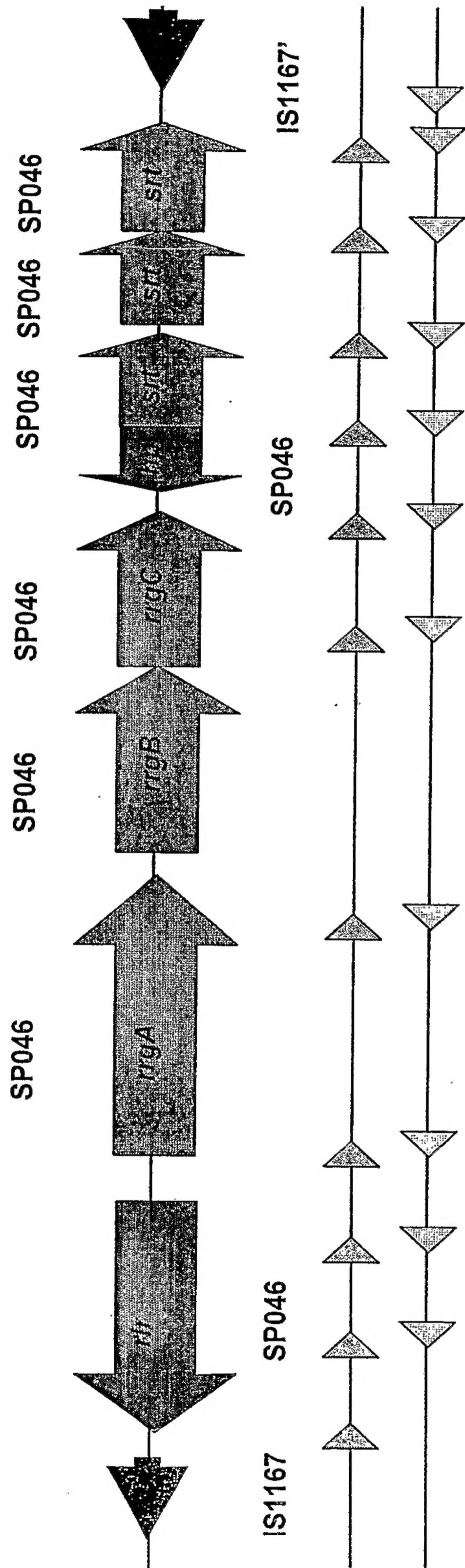
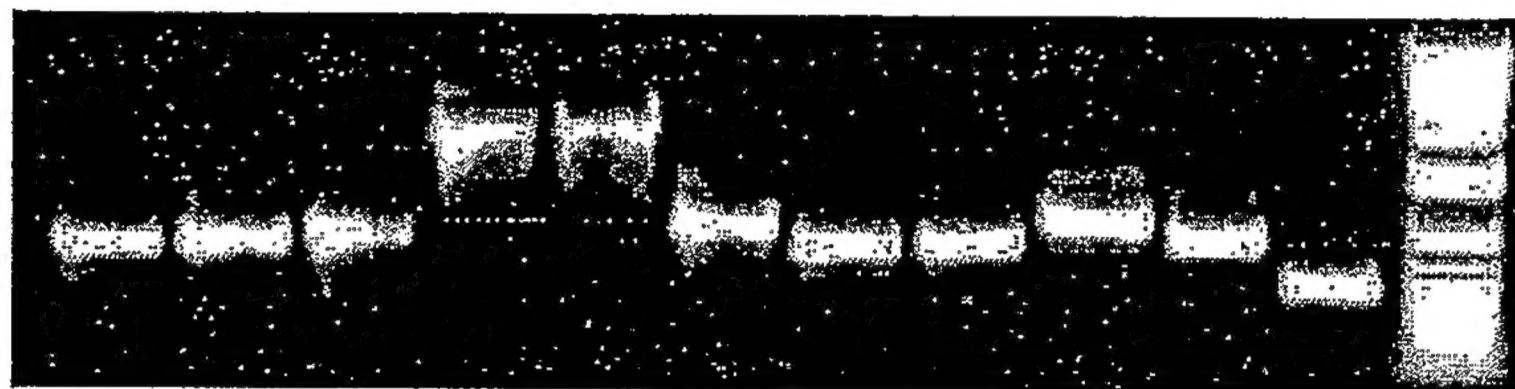


Figure 138

PCT/US2005/027239 330/487

A



TIGR4

B

PCR product	contig_length _TIGR4	overlap
1	754	83
2	759	84
3	847	98
4	2550	99
5	2736	99
6	925	99
7	745	87
8	765	94
9	1008	94
10	802	64
11	461	

Figure 139

PCT/US05/27239 331/487

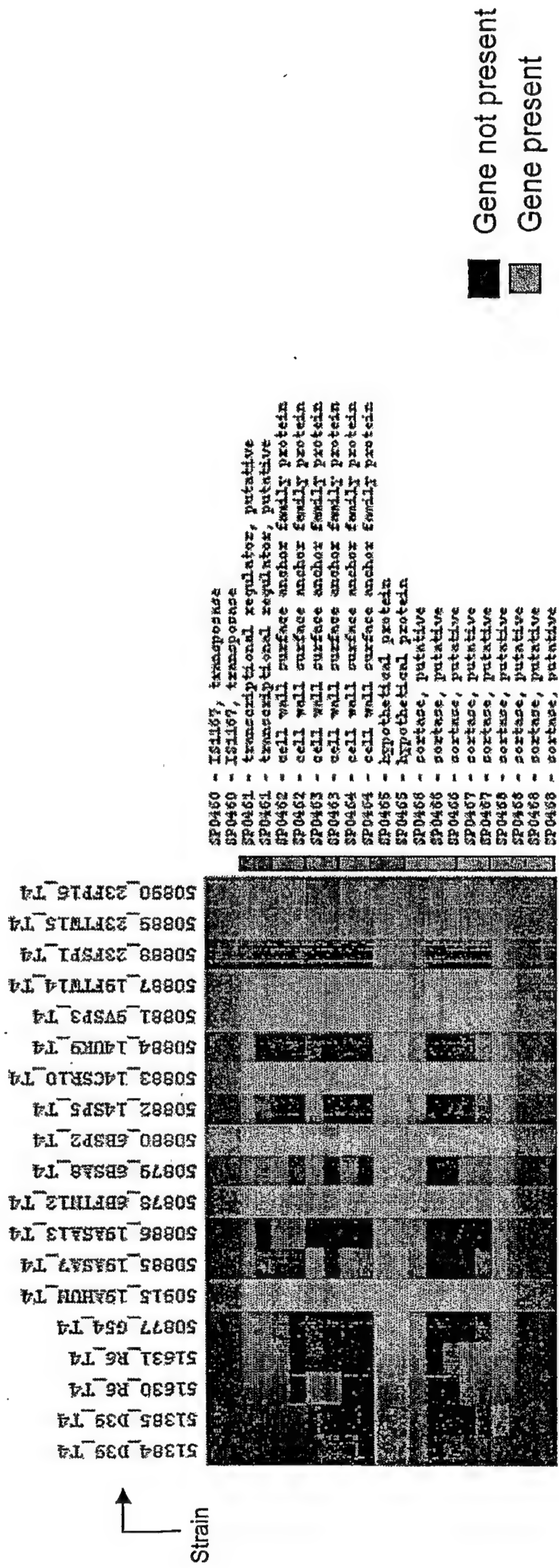


Figure 140

Figure 141A

ORF2_14CSR	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_19AH	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_19FTW	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_23FP	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_23FTW	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_670	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_6BF	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_6BSP	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_TIGR	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_9VSP	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN

ORF2_14CSR	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_19AH	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_19FTW	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_23FP	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_23FTW	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_670	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_6BF	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_6BSP	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_TIGR	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_9VSP	LDTQQVQLIEHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR

ORF2_14CSR	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGEIYDLNDGSMDWVTHMIVQ
ORF2_19AH	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGEIYDLNDGSMDWVTHMIVQ
ORF2_19FTW	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGEIYDLNDGSMDWVTHMIVQ
ORF2_23FP	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGEIYDLNDGSMDWVTHMIVQ
ORF2_23FTW	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGEIYDLNDGSMDWVTHMIVQ
ORF2_670	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGEIYDLNDGSMDWVTHMIVQ
ORF2_6BF	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGEIYDLNDGSMDWVTHMIVQ
ORF2_6BSP	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGEIYDLNDGSMDWVTHMIVQ
ORF2_TIGR	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGEIYDLNDGSMDWVTHMIVQ
ORF2_9VSP	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGEIYDLNDGSMDWVTHMIVQ

ORF2_14CSR	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_19AH	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_19FTW	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_23FP	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_23FTW	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_670	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_6BF	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_6BSP	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_TIGR	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_9VSP	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ

ORF2_14CSR	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQILILQHTRGKHLLSKF
ORF2_19AH	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQILILQHTRGKHLLSKF
ORF2_19FTW	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQILILQHTRGKHLLSKF
ORF2_23FP	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQILILQHTRGKHLLSKF
ORF2_23FTW	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQILILQHTRGKHLLSKF
ORF2_670	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQILILQHTRGKHLLSKF
ORF2_6BF	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQILILQHTRGKHLLSKF
ORF2_6BSP	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQILILQHTRGKHLLSKF
ORF2_TIGR	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQILILQHTRGKHLLSKF
ORF2_9VSP	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQILILQHTRGKHLLSKF

PCT/US05/27239

Figure 141B

ORF2_14CSR KNILGNDISNSLSFLTALTFLTRTFLEFGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE
ORF2_19AH KNILGNDISNSLSFLTALTFLTRTFLEFGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE
ORF2_19FTW KNILGNDISNSLSFLTALTFLTRTFLEFGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE
ORF2_23FP KNILGNDISNSLSFLTALTFLTRTFLEFGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE
ORF2_23FTW KNILGNDISNSLSFLTALTFLTRTFLEFGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE
ORF2_670 KNILGNDISNSLSFLTALTFLTRTFLEFGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE
ORF2_6BF KNILGNDISNSLSFLTALTFLTRTFLEFGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE
ORF2_6BSP KNILGNDISNSLSFLTALTFLTRTFLEFGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE
ORF2_TIGR KNILGNDISNSLSFLTALTFLTRTFLEFGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE
ORF2_9VSP KNILGNDISNSLSFLTALTFLTRTFLEFGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE

ORF2_14CSR WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK
ORF2_19AH WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK
ORF2_19FTW WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK
ORF2_23FP WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK
ORF2_23FTW WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK
ORF2_670 WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK
ORF2_6BF WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK
ORF2_6BSP WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK
ORF2_TIGR WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK
ORF2_9VSP WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK

ORF2_14CSR VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_19AH VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_19FTW VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_23FP VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_23FTW VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_670 VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_6BF VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_6BSP VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_TIGR VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR
ORF2_9VSP VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR

ORF2_14CSR LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_19AH LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_19FTW LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_23FP LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_23FTW LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_670 LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_6BF LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_6BSP LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_TIGR LIYQTIVDIRKEAFDKRVAMIAKKAHYLL
ORF2_9VSP LIYQTIVDIRKEAFDKRVAMIAKKAHYLL

Figure 142A

ORF3_19AH	MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_23FP	MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_14CSR	MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_670	MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_6BF	MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_6BSP	MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_19FTW	MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_9VSP	MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_23FTW	MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF
ORF3_TIGR	MKKVRKIFQKAVAGLCCISQLTAFSSIVALAETPETSIPAIGKVVIKETGEGGALLGDAVF

ORF3_19AH	ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_23FP	ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_14CSR	ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_670	ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_6BF	ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_6BSP	ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_19FTW	ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_9VSP	ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_23FTW	ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
ORF3_TIGR	ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVPVGYKPSTKQWTVEVEKNGRT
	*****:*****
ORF3_19AH	TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_23FP	TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_14CSR	TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_670	TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_6BF	TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_6BSP	TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_19FTW	TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_9VSP	TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_23FTW	TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG
ORF3_TIGR	TVQGEQVENREEALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKALNPNPYERVIPEG

ORF3_19AH	TLISKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_23FP	TLISKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_14CSR	TLISKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_670	TLISKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_6BF	TLISKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_6BSP	TLISKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
ORF3_19FTW	TLISKRIYQVNNLDDNQYGIELTVSGKTVYERKDKSVPLDVVILLDNSNSMSNIRNKNARR
ORF3_9VSP	TLISKRIYQVNNLDDNQYGIELTVSGKTVYERKDKSVPLDVVILLDNSNSMSNIRNKNARR
ORF3_23FTW	TLISKRIYQVNNLDDNQYGIELTVSGKTVYEQKDKSVPLDVVILLDNSNSMSNIRNKNARR
ORF3_TIGR	TLISKRIYQVNNLDDNQYGIELTVSGKTVYEQKDKSVPLDVVILLDNSNSMSNIRNKNARR
	*****. *: *.*****:.*:*
ORF3_19AH	AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
ORF3_23FP	AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
ORF3_14CSR	AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
ORF3_670	AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
ORF3_6BF	AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
ORF3_6BSP	AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
ORF3_19FTW	AERAGEATRSLIDKITSNPDNRVALVTYASTIFDGTEFTVEKGVADKNGKRLNDSLFWNY
ORF3_9VSP	AERAGEATRSLIDKITSNPDNRVALVTYASTIFDGTEFTVEKGVADKNGKRLNDSLFWNY
ORF3_23FTW	AERAGEATRSLIDKITSNPDNRVALVTYASTIFDGTEFTVEKGVADKNGKRLNDSLFWNY
ORF3_TIGR	AERAGEATRSLIDKITSNPDNRVALVTYASTIFDGTEFTVEKGVADKNGKRLNDSLFWNY
	*:*****:.*:*****.*****:***** ** *

Figure 142B

ORF3_19AH
ORF3_23FP
ORF3_14CSR
ORF3_670
ORF3_6BF
ORF3_6BSP
ORF3_19FTW
ORF3_9VSP
ORF3_23FTW
ORF3_TIGR

DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD
DQTSFТTNTKDYSYLKLТNDKNДIVELKNKVPTЕAEDHDGNRLMYQFGATFTQKALMKAD
DQTSFТTNTKDYSYLKLТNDKNДIVELKNKVPTЕAEDHDGNRLMYQFGATFTQKALMKAD
DQTSFТTNTKDYSYLKLТNDKNДIVELKNKVPTЕAEDHDGNRLMYQFGATFTQKALMKAD
DQTSFТTNTKDYSYLKLТNDKNДIVELKNKVPTЕAEDHDGNRLMYQFGATFTQKALMKAD
*: *: **: * : *: *: *. * . ** : *: *: *: *: *: : : : ***** *

ORF3_19AH
ORF3_23EP
ORF3_14CSR
ORF3_670
ORF3_6BF
ORF3_6BSP
ORF3_19FTW
ORF3_9VSP
ORF3_23FTW
ORF3_TIGR

DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNEFKAKTPNSSGILLE
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNEFKAKTPNSSGILLE
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNEFKAKTPNSSGILLE
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNEFKAKTPNSSGILLE
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNEFKAKTPNSSGILLE
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNEFKAKTPNSSGILLE
EILTQQARQNSQKVIFHITDGVPTMSYPINFENHATFAPSYQNQLNAFFFSKSPNKDGILLS
EILTQQARQNSQKVIFHITDGVPTMSYPINFENHATFAPSYQNQLNVFFFSKSPNKDGILLS
EILTQQARQNSQKVIFHITDGVPTMSYPINFENHATFAPSYQNQLNAFFFSKSPNKDGILLS
EILTQQARQNSQKVIFHITDGVPTMSYPINFENHATFAPSYQNQLNAFFFSKSPNKDGILLS
:***:*** **:*****::: : **: .*** * :*:** .****

ORF3_19AH
ORF3_23FP
ORF3_14CSR
ORF3_670
ORF3_6BF
ORF3_6BSP
ORF3_19FTW
ORF3_9VSP
ORF3_23FTW
ORF3_TIGR

D F V T W S A D G E H K I V R G D G E S Y Q M F T K K P V T D Q Y G V H Q I L S I T S M E Q R A K L V S A G Y R F Y G T
D F V T W S A D G E H K I V R G D G E S Y Q M F T K K P V T D Q Y G V H Q I L S I T S M E Q R A K L V S A G Y R F Y G T
D F V T W S A D G E H K I V R G D G E S Y Q M F T K K P V T D Q Y G V H Q I L S I T S M E Q R A K L V S A G Y R F Y G T
D F V T W S A D G E H K I V R G D G E S Y Q M F T K K P V T D Q Y G V H Q I L S I T S M E Q R A K L V S A G Y R F Y G T
D F V T W S A D G E H K I V R G D G E S Y Q M F T K K P V T D Q Y G V H Q I L S I T S M E Q R A K L V S A G Y R F Y G T
D F V T W S A D G E H K I V R G D G E S Y Q M F T K K P V T D Q Y G V H Q I L S I T S M E Q R A K L V S A G Y R F Y G T
D F I T Q A T S G E H T I V R G D G Q S Y Q M F T D K T V Y E K - G A P A A F P V K - P E K Y S E M K A V G Y A V I G D
D F I T Q A T S G E H T I V R G D G Q S Y Q M F T D K T V Y E K - G A P A A F P V K - P E K Y S E M K A V G Y A V I G D
D F I T Q A T S G E H T I V R G D G Q S Y Q M F T D K T V Y E K - G A P A A F P V K - P E K Y S E M K A A G Y A V I G D
D F I T Q A T S G E H T I V R G D G Q S Y Q M F T D K T V Y E K - G A P A A F P V K - P E K Y S E M K A A G Y A V I G D
*: * : . . * * * . * * * * : * * * * . * . * : : * . : . : . * : : : : * * . *

ORF3_19AH
ORF3_23FP
ORF3_14CSR
ORF3_670
ORF3_6BF
ORF3_6BSP
ORF3_19FTW
ORF3_9VSP
ORF3_23FTW
ORF3_TIGR

```

-----DLYLYWRDSILAYPFNSSTDWITNHGDPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPTTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPTTWYYNGNMAQDGYDVFTVGVGVNGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGAPTRWYYNGNIAPDGYDVFTVIGIGINGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVIGIGINGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVIGIGINGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVIGIGINGDP
: * ** : ***** . * ***** ** ***** : * ***** . . *****

```

ORF3_19AH
ORF3_23FP
ORF3_14CSR
ORF3_670
ORF3_6BF
ORF3_6BSP
ORF3_19FTW
ORF3_9VSP
ORF3_23FTW
ORF3_TIGR

```

GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTITDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTITDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTITDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTITDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTITDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTITDPMGEL
GTDEATATSEFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENTITDPMGEL
GTDEATATSEFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENTITDPMGEL
GTDEATATSEFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENTITDPMGEL
GTDEATATSEFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENTITDPMGEL
*****  ***** . *:*****:*.::*:::*****:***.*****

```

Figure 142C

ORF3_19AH
ORF3_23FP
ORF3_14CSR
ORF3_670
ORF3_6BF
ORF3_6BSP
ORF3_19FTW
ORF3_9VSP
ORF3_23FTW
ORF3_TIGR

IDFQLGADGRFDPADYTLTANDGSSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG
IDFQLGADGRFDPADYTLTANDGSSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG
IDFQLGADGRFDPADYTLTANDGSSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG
IDFQLGADGRFDPADYTLTANDGSSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG
IDFQLGADGRFDPADYTLTANDGSSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG
IDFQLGADGRFDPADYTLTANDGSSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG
IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNAKVFYDTTEKRIRVTG
IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNAKVFYDTTEKRIRVTG
IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNAKVLYDTTEKRIRVTG
IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNAKVLYDTTEKRIRVTG
*: *: ***** * * . ***** *

ORF3_19AH
ORF3_23FP
ORF3_14CSR
ORF3_670
ORF3_6BF
ORF3_6BSP
ORF3_19FTW
ORF3_9VSP
ORF3_23FTW
ORF3_TIGR

LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRRTLHPKEVEKNTVRDFPIPKIRDVRKY P
 LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRRTLHPKEVEKNTVRDFPIPKIRDVRKY P
 LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRRTLHPKEVEKNTVRDFPIPKIRDVRKY P
 LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRRTLHPKEVEKNTVRDFPIPKIRDVRKY P
 LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRRTLHPKEVEKNTVRDFPIPKIRDVRKY P
 LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRRTLHPKEVEKNTVRDFPIPKIRDVRKY P
 LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRRTLHPKEVEKNTVRDFPIPKIRDVRKY P
 LYLGTGEKVTLTYNVRLNDQFVSNKFYDTNGRRTLHPKEVEKNTVRDFPIPKIRDVRKY P
 LYLGTDEKVTLTYNVRLNDEFVSNKFYDTNGRRTLHPKEVEQNTVRDFPIPKIRDVRKY P
 LYLGTDEKVTLTYNVRLNDEFVSNKFYDTNGRRTLHPKEVEQNTVRDFPIPKIRDVRKY P
 ***** . ***** . ***** . *****

ORF3_19AH
ORF3_23FP
ORF3_14CSR
ORF3_670
ORF3_6BF
ORF3_6BSP
ORF3_19FTW
ORF3_9VSP
ORF3_23FTW
ORF3_TIGR

```
EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
AITIAKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
AITIAKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITISKEKKLGDIEFIKVNKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITISKEKKLGDIEFIKVNKNDKKPLRGAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
***  ***** . ***** . ***** . ***** . ***** . *****
```

ORF3_19AH
ORF3_23FP
ORF3_14CSR
ORF3_670
ORF3_6BF
ORF3_6BSP
ORF3_19FTW
ORF3_9VSP
ORF3_23FTW
ORF3_TIGR

[illegible]

ORF3_19AH
ORF3_23FP
ORF3_14CSR
ORF3_670
ORF3_6BF
ORF3_6BSP
ORF3_19FTW
ORF3_9VSP
ORF3_23FTW
ORF3_TIGR

TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKNP
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKNP
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP
TNDKHYITNEPIPPKREYPRTGIGIMLLFYILIGCMMMGGVLLYTRKHP
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP

Figure 143A

ORF4_6BF MKSINKFLTMLAALLLTASSLFSAA TVFAADNVSTAPDAVTKTLTIHKLLLS EDDLKTWD
ORF4_6BSP MKSINKFLTMLAALLLTASSLFSAA TVFAADNVSTAPDAVTKTLTIHKLLLS EDDLKTWD
ORF4_670 MKSINKFLTMLAALLLTASSLFSAA TVFAADNVSTAPDAVTKTLTIHKLLLS EDDLKTWD
ORF4_14CSR MKSINKFLTMLAALLLTASSLFSAA TVFAADNVSTAPDAVTKTLTIHKLLLS EDDLKTWD
ORF4_19AH MKSINKFLTMLAALLLTASSLFSAA TVFAADNVSTAPDAVTKTLTIHKLLLS EDDLKTWD
ORF4_23FP MKSINKFLTMLAALLLTASSLFSAA TVFAADNVSTAPDAVTKTLTIHKLLLS EDDLKTWD
ORF4_23FTW MKSINKFLTMLAALLLTASSLFSAA TVFAAEQK-----TKTLTVHKLLMTDQELD A WN
ORF4_19FTW MKSINKFLTMLAALLLTASSLFSAA TVFAAGTT-----TTSVTVHKLLATDGDMDKIA
ORF4_9VSP MKSINKFLTMLAALLLTASSLFSAA TVFAAGTT-----TTSVTVHKLLATDGDMDKIA
ORF4_TIGR MKSINKFLTMLAALLLTASSLFSAA TVFAAGTT-----TTSVTVHKLLATDGDMDKIA
*****:*****.*****
.::**** : : :.

ORF4_6BF TNGPK--GYDGTQ-----SSLKDLTG VVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
ORF4_6BSP TNGPK--GYDGTQ-----SSLKDLTG VVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
ORF4_670 TNGPK--GYDGTQ-----SSLKDLTG VVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
ORF4_14CSR TNGPK--GYDGTQ-----SSLKDLTG VVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
ORF4_19AH TNGPK--GYDGTQ-----SSLKDLTG VVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
ORF4_23FP TNGPK--GYDGTQ-----SSLKDLTG VVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
ORF4_23FTW SDAITTAGYDGSQN---FEQFKQLQGV PQGVT EISGVAFELQSYTG PQGKEQENLTND-A
ORF4_19FTW NELETG-NYAGNKVGVLPANAKEIAGVMFVW T N T N N E I I D E N G Q T L G V N I D P Q T F K L S G A
ORF4_9VSP NELETG-NYAGNKVGVLPANAKEIAGVMFVW T N T N N E I I D E N G Q T L G V N I D P Q T F K L S G A
ORF4_TIGR NELETG-NYAGNKVGVLPANAKEIAGVMFVW T N T N N E I I D E N G Q T L G V N I D P Q T F K L S G A
.: . . * * . : . * : * * : . : : . . : : . . .

ORF4_6BF KWTTVHGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL
ORF4_6BSP KWTTVHGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL
ORF4_670 KWTTVHGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL
ORF4_14CSR KWTTVHGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL
ORF4_19AH KWTTVHGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL
ORF4_23FP KWTTVHGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL
ORF4_23FTW VWTAVNKGVT TETGVKFDTEVLQG-TYRLVEVRKESTYVGPNGKVLTGMKAVPALITLPL
ORF4_19FTW MPATAMKKL TEAEGAKFNTANLPAAKYKIYEIHSLS TYVGEDGATLTGSKAVPIEIELPL
ORF4_9VSP MPATAMKKL TEAEGAKFNTANLPAAKYKIYEIHSLS TYVGEDGATLTGSKAVPIEIELPL
ORF4_TIGR MPATAMKKL TEAEGAKFNTANLPAAKYKIYEIHSLS TYVGEDGATLTGSKAVPIEIELPL
: . : * * * : * * . * : * : . : * * * : * * * * * : * * *

ORF4_6BF VNNNGTVIDAHVF PKNSYNKP VVDKRIADTLNYND-----QNGLSIGTKIPYV VNTTI
ORF4_6BSP VNNNGTVIDAHVF PKNSYNKP VVDKRIADTLNYND-----QNGLSIGTKIPYV VNTTI
ORF4_670 VNNNGTVIDAHVF PKNSYNKP VVDKRIADTLNYND-----QNGLSIGTKIPYV VNTTI
ORF4_14CSR VNNNGTVIDAHVF PKNSYNKP VVDKRIADTLNYND-----QNGLSIGTKIPYV VNTTI
ORF4_19AH VNNNGTVIDAHVF PKNSYNKP VVDKRIADTLNYND-----QNGLSIGTKIPYV VNTTI
ORF4_23FP VNNNGTVIDAHVF PKNSYNKP VVDKRIADTLNYND-----QNGLSIGTKIPYV VNTTI
ORF4_23FTW VNQNGVVENAHVYPKNS EDKPTATKTFTD TAAGFVDP-----GEKGLAIGTKVPYIVTTTI
ORF4_19FTW ND----VVD AHVYPK NTEAKPKIDKDFKGKANPDTPRV DKDTPVNHQVGDVVEYEIVTKI
ORF4_9VSP ND----VVD AHVYPK NTEAKPKIDKDFKGKANPDTPRV DKDTPVNHQVGDVVEYEIVTKI
ORF4_TIGR ND----VVD AHVYPK NTEAKPKIDKDFKGKANPDTPRV DKDTPVNHQVGDVVEYEIVTKI
: * : * * : * * : * * * : * * * : * * : * : * *

ORF4_6BF PSNATFATSFWSD EMT EGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_6BSP PSNATFATSFWSD EMT EGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_670 PSNATFATSFWSD EMT EGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_14CSR PSNATFATSFWSD EMT EGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_19AH PSNATFATSFWSD EMT EGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_23FP PSNATFATSFWSD EMT EGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK
ORF4_23FTW PKNSTLATAFWSD EMT EGLDYN-GDVVN YNNGQPLD NSHYTLEAGHNGFILKLNEKGLEA
ORF4_19FTW PALANYATANWSDRMTEGLAFNKGT VKVTVD DVALEAGDYALTEVATGF DLKLTDAGLAK
ORF4_9VSP PALANYATANWSDRMTEGLAFNKGT VKVTVD DVALEAGDYALTEVATGF DLKLTDAGLAK
ORF4_TIGR PALANYATANWSDRMTEGLAFNKGT VKVTVD DVALEAGDYALTEVATGF DLKLTDAGLAK
* : . * * : * * . * * * : * * * : . : . : * : . * * * * : * *

Figure 143B

[illegible]

P E T R O B R O U S K I

Figure 143C

ORF4_6BF
ORF4_6BSP
ORF4_670
ORF4_14CSR
ORF4_19AH
ORF4_23FP
ORF4_23FTW
ORF4_19FTW
ORF4_9VSP
ORF4_TIGR

ORF4_6BF	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_6BSP	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_670	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_14CSR	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_19AH	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_23FP	AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_23FTW	AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_19FTW	AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_9VSP	AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_TIGR	AGAAIMGIAVYAYVKNNKDEDQLA
	, *, *****

Figure 144A

ORF5_6BSP -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_TIGR -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_6BF -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_670 -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_19AH -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_14CSR -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_19FTW -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_23FTW -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_9VSP MTMQKMQKMQKMQKMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV
ORF5_23FP -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV

ORF5_6BSP VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_TIGR VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_6BF VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_670 VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_19AH VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_14CSR VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_19FTW VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_23FTW VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_9VSP VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV
ORF5_23FP VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV

ORF5_6BSP SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_TIGR SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_6BF SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_670 SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_19AH SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_14CSR SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH
ORF5_19FTW SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKADTVTTKVLIKVDQDH
ORF5_23FTW SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKADTVTTKVLIKVDQDH
ORF5_9VSP SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKADTVTTKVLIKVDQDH
ORF5_23FP SHIPNGLYYVRSIIQTDAVSYPAEFLFEMTDQTVPLVIVAKKADTVTTKVLIKVDQDH

ORF5_6BSP NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGNYRF
ORF5_TIGR NRLEGVGFKLVSVARDVSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGNYRF
ORF5_6BF NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGNYRF
ORF5_670 NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGNYRF
ORF5_19AH NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGNYRF
ORF5_14CSR NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGNYRF
ORF5_19FTW NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGTYRF
ORF5_23FTW NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGTYRF
ORF5_9VSP NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGTYRF
ORF5_23FP NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGTYRF

ORF5_6BSP KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_TIGR KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_6BF KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_670 KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_19AH KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_14CSR KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_19FTW KEVEPLAGYAVTTMDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_23FTW KEVEPLAGYAVTTMDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_9VSP KEVEPLAGYAVTTMDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV
ORF5_23FP KEVEPLAGYAVTTMDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV

PCT/US05/27239

Figure 144B

ORF5_6BSP	MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTEIWELOAPTCYVOLTSPVSFTI
ORF5_TIGR	MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTEIWELOAPTCYVOLTSPVSFTI
ORF5_6BF	MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTEIWELOAPTCYVOLTSPVSFTI
ORF5_670	MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTEIWELOAPTCYVOLTSPVSFTI
ORF5_19AH	MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTEIWELOAPTCYVOLTSPVSFTI
ORF5_14CSR	MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYGTEIWELOAPTCYVOLTSPVSFTI
ORF5_19FTW	MKEENGHYTPVLQNGKEVVVASGKDGRFRVEGLEYGTEIWELOAPTCYVOLTSPVSFTI
ORF5_23FTW	MKEENGHYTPVLQNGKEVVVASGKDGRFRVEGLEYGTEIWELOAPTCYVOLTSPVSFTI
ORF5_9VSP	MKEENGHYTPVLQNGKEVVVASGKDGRFRVEGLEYGTEIWELOAPTCYVOLTSPVSFTI
ORF5_23FP	MKEENGHYTPVLQNGKEVVVASGKDGRFRVEGLEYGTEIWELOAPTCYVOLTSPVSFTI

****.*****:*****

ORF5_6BSP	GKDTRKELVTVVKNNKRPRIDVPEDTGEETLYIILMLVAILLFGSGYYLTKKPNN
ORF5_TIGR	GKDTRKELVTVVKNNKRPRIDVPEDTGEETLYIILMLVAILLFGSGYYLTKKPNN
ORF5_6BF	GKDTRKELVTVVKNNKRPRIDVPEDTGEETLYIILMLVAILLFGSGYYLTKKPNN
ORF5_670	GKDTRKELVTVVKNNKRPRIDVPEDTGEETLYIILMLVAILLFGSGYYLTKKPNN
ORF5_19AH	GKDTRKELVTVVKNNKRPRIDVPEDTGEETLYIILMLVAILLFGSGYYLTKKPNN
ORF5_14CSR	GKDTRKELVTVVKNNKRPRIDVPEDTGEETLYIILMLVAILLFGSGYYLTKKPNN
ORF5_19FTW	GKDTRKELVTVVKNNKRPRIDVPEDTGEETLYIILMLVAILLFGSGYYLTKKTN
ORF5_23FTW	GKDTRKELVTVVKNNKRPRIDVPEDTGEETLYIILMLVAILLFGSGYYLTKKTN
ORF5_9VSP	GKDTRKELVTVVKNNKRPRIDVPEDTGEETLYIILMLVAILLFGSGYYLTKKTN
ORF5_23FP	GKDTRKELVTVVKNNKRPRIDVPEDTGEETLYIILMLVAILLFGSGYYLTKKTN

*****. **

PCT/US05/27239

Figure 145A

ORF6_23FTW	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_TIGR	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_6BSP	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_6BF	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_670	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_19AH	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_14CSR	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_23FP	MLIKMAKTKKQKRNNLLLGVVFFIGIAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_9VSP	MLIKMAKTKKQKRNNLLLGVVFFIGIAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_19FTW	MLIKMAKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
	*****:*****
ORF6_23FTW	DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_TIGR	DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_6BSP	DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_6BF	DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_670	DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_19AH	DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_14CSR	DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_23FP	DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_9VSP	DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_19FTW	DIDERMKLAQAFNDSLNNVVSGDPWSEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
	*****:*****
ORF6_23FTW	VYAGTAEVVLQQGAGQLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_TIGR	VYAGTAEVVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_6BSP	VYAGTAEVVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_6BF	VYAGTAEVVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_670	VYAGTAEVVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_19AH	VYAGTAEVVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_14CSR	VYAGTAEVVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_23FP	VYAGTAEVVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_9VSP	VYAGTAEVVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
ORF6_19FTW	VYAGTAEVVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLKVGDKFYVH
	*****:*****
ORF6_23FTW	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_TIGR	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_6BSP	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_6BF	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_670	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_19AH	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_14CSR	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_23FP	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_9VSP	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_19FTW	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
	*****:*****
ORF6_23FTW	VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_TIGR	VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_6BSP	VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_6BF	VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_670	VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_19AH	VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_14CSR	VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_23FP	VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQSERALKALKEATKEVKVE
ORF6_9VSP	VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQSERALKALKEATKEVKVE
ORF6_19FTW	VEEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQSERALKALKEATKEVKVE
	*****:*****

PCT/US2005/027239

Figure 145B

ORF6_23FTW	DGQQ
ORF6_TIGR	DGQQ
ORF6_6BSP	DGQQ
ORF6_6BF	DGQQ
ORF6_670	DGQQ
ORF6_19AH	DGQQ
ORF6_14CSR	DGQQ
ORF6_23FP	DE--
ORF6_9VSP	DE--
ORF6_19FTW	DE-

344/487

ORF7_14CSR	MDNSRRSRKKGTKKKKHPLILLIIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_19AH	MDNSRRSRKKGTKKKKHPLILLIIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_6BF	MDNSRRSRKKGTKKKKHPLILLIIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_6BSP	MDNSRRSRKKGTKKKKHPLILLIIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_670	MDNSRRSRKKGTKKKKHPLILLIIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_23FTW	MDNSRRSRKKGTKKKKHPLILLIIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_23FP	MSKSRYSRKKS VKKKKNPFILLIIFLVGLAVAMYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_9VSP	MSKSRYSRKKS VKKKKNPFILLIIFLVGLAVAMYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_19FTW	MSKSRYSRKKS VKKKKNPFILLIIFLVGLAVAMYPLVSRYYYRIESNEVIKEFDETVSQM
ORF7_TIGR	MDNSRRSRKKGTKKKKHPLILLIIFLVGFAVAIYPLVSRYYYRIESNEVIKEFDETVSQM * . : * * * * * . : * * * * * : * . : * * * * * : * * * * * : * * * * * : * * * * * : * * * * * : *
ORF7_14CSR	DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_19AH	DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_6BF	DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_6BSP	DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_670	DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_23FTW	DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_23FP	DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_9VSP	DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_19FTW	DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ
ORF7_TIGR	DKAELEERWRLAQAFNATLKPSEILDPFTEQEKKKGVSEYANMLKVHERIGYVEIPAIDQ * * * * * : * * * * * : * * * * * : * * * * * : *
ORF7_14CSR	EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVT AHRGLPTAE LFSQLDKMKKGDVF
ORF7_19AH	EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVT AHRGLPTAE LFSQLDKMKKGDVF
ORF7_6BF	EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVT AHRGLPTAE LFSQLDKMKKGDVF
ORF7_6BSP	EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVT AHRGLPTAE LFSQLDKMKKGDVF
ORF7_670	EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVT AHRGLPTAE LFSQLDKMKKGDVF
ORF7_23FTW	EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVT AHRGLPTAE LFSQLDKMKKGDVF
ORF7_23FP	EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVT AHRGLPTAE LFSQLDKMKKGDIF
ORF7_9VSP	EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVT AHRGLPTAE LFSQLDKMKKGDIF
ORF7_19FTW	EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVT AHRGLPTAE LFSQLDKMKKGDIF
ORF7_TIGR	EIPMYVGTSEEILQKGAGLLEGASLPVGGENTHTVVT AHRGLPTAE LFSQLDKMKKGDIF * * * * * : * * * * * : * * * * * : * * * * * : *
ORF7_14CSR	YLHVLDQV LAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_19AH	YLHVLDQV LAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_6BF	YLHVLDQV LAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_6BSP	YLHVLDQV LAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_670	YLHVLDQV LAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_23FTW	YLHVLDQV LAYQVDQILTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_23FP	YLHVLDQV LAYQVDQIVTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_9VSP	YLHVLDQV LAYQVDQIVTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_19FTW	YLHVLDQV LAYQVDQIVTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY
ORF7_TIGR	YLHVLDQV LAYQVDQIVTVEPNDFEPVLIQHGEDYATLLTCTPYMINSHRLLVRGKRIPY * * * * * : * * * * * : * * * * * : * * * * * : *
ORF7_14CSR	TAPIAERNRAVRERGGQFWLWLLLAALVMILVLSYGVYRHRRI VKGLEKQLEEHHVKG
ORF7_19AH	TAPIAERNRAVRERGGQFWLWLLLAALVMILVLSYGVYRHRRI VKGLEKQLEEHHVKG
ORF7_6BF	TAPIAERNRAVRERGGQFWLWLLLAALVMILVLSYGVYRHRRI VKGLEKQLEEHHVKG
ORF7_6BSP	TAPIAERNRAVRERGGQFWLWLLLAALVMILVLSYGVYRHRRI VKGLEKQLEEHHVKG
ORF7_670	TAPIAERNRAVRERGGQFWLWLLLAALVMILVLSYGVYRHRRI VKGLEKQLEEHHVKG
ORF7_23FTW	TAPIAERNRAVRERGGQFWLWLLLAALVMILVLSYGVYRHRRI VKGLEKQLEEHHVKG
ORF7_23FP	TAPIAERNRAVRERGGQFWLWLLLGAMAVILLLLYRVYRNRRIVKGLEKQLEGRHVKD
ORF7_9VSP	TAPIAERNRAVRERGGQFWLWLLLGAMAVILLLLYRVYRNRRIVKGLEKQLEGRHVKD
ORF7_19FTW	TAPIAERNRAVRERGGQFWLWLLLGAMAVILLLLYRVYRNRRIVKGLEKQLEGRHVKD
ORF7_TIGR	TAPIAERNRAVRERGGQFWLWLLLGAMAVILLLLYRVYRNRRIVKGLEKQLEGRHVKD * * * * * : * * * * * : * * * * * : * * * * * : *

Figure 147

```

ORF8_14CSR      FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_19AH       FTKEGQSVSRVATSQWLYRGLVVLAFMGILFVLWKLARLLRGK
ORF8_23FTW      FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_670        FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_6BF        FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_6BSP       FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_19FTW      FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_23FP       FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_9VSP       FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_TIGR       FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
*****

```

PCT/US2005/027239 346/487

RrgA, LPXTG

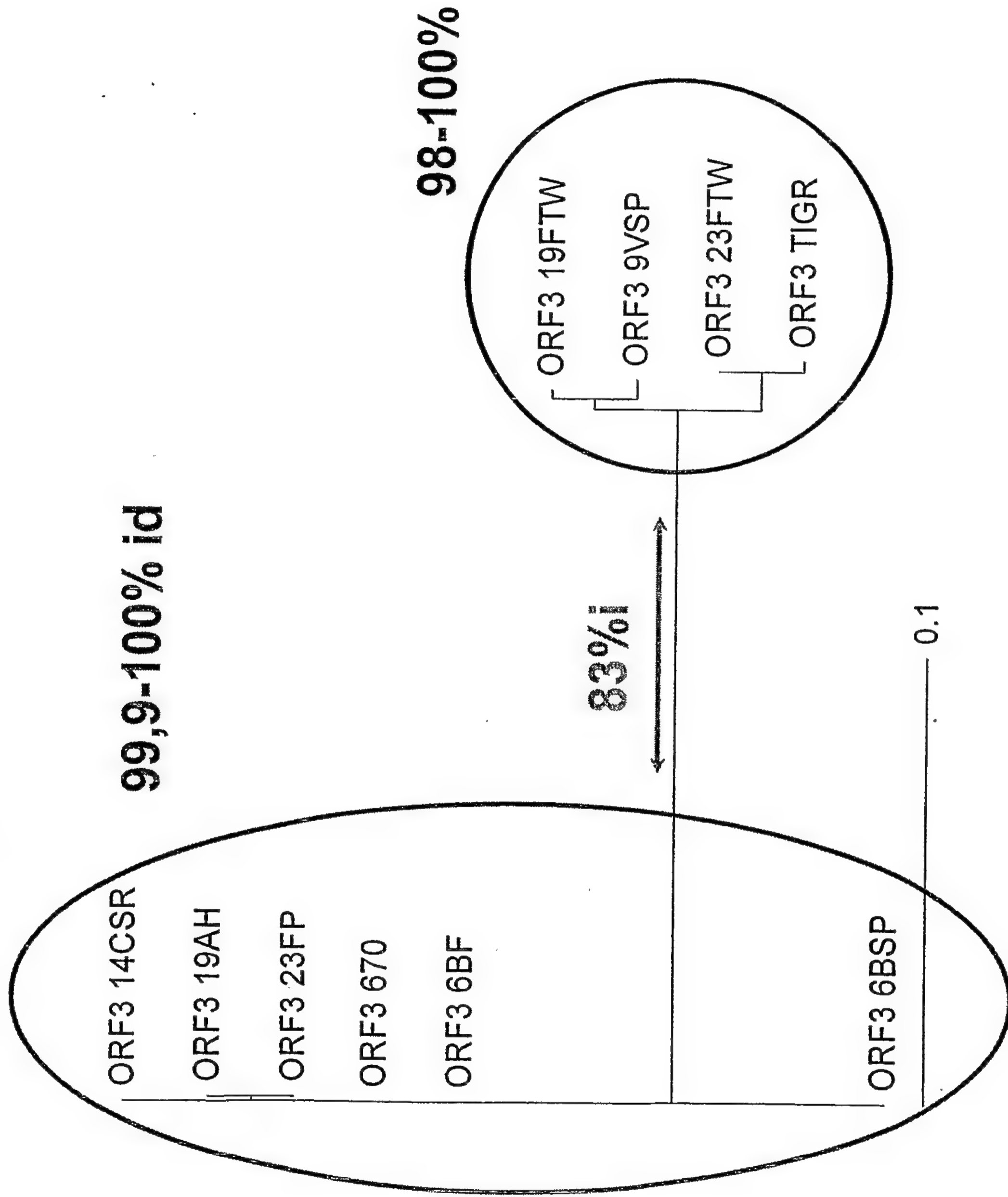


Figure 148

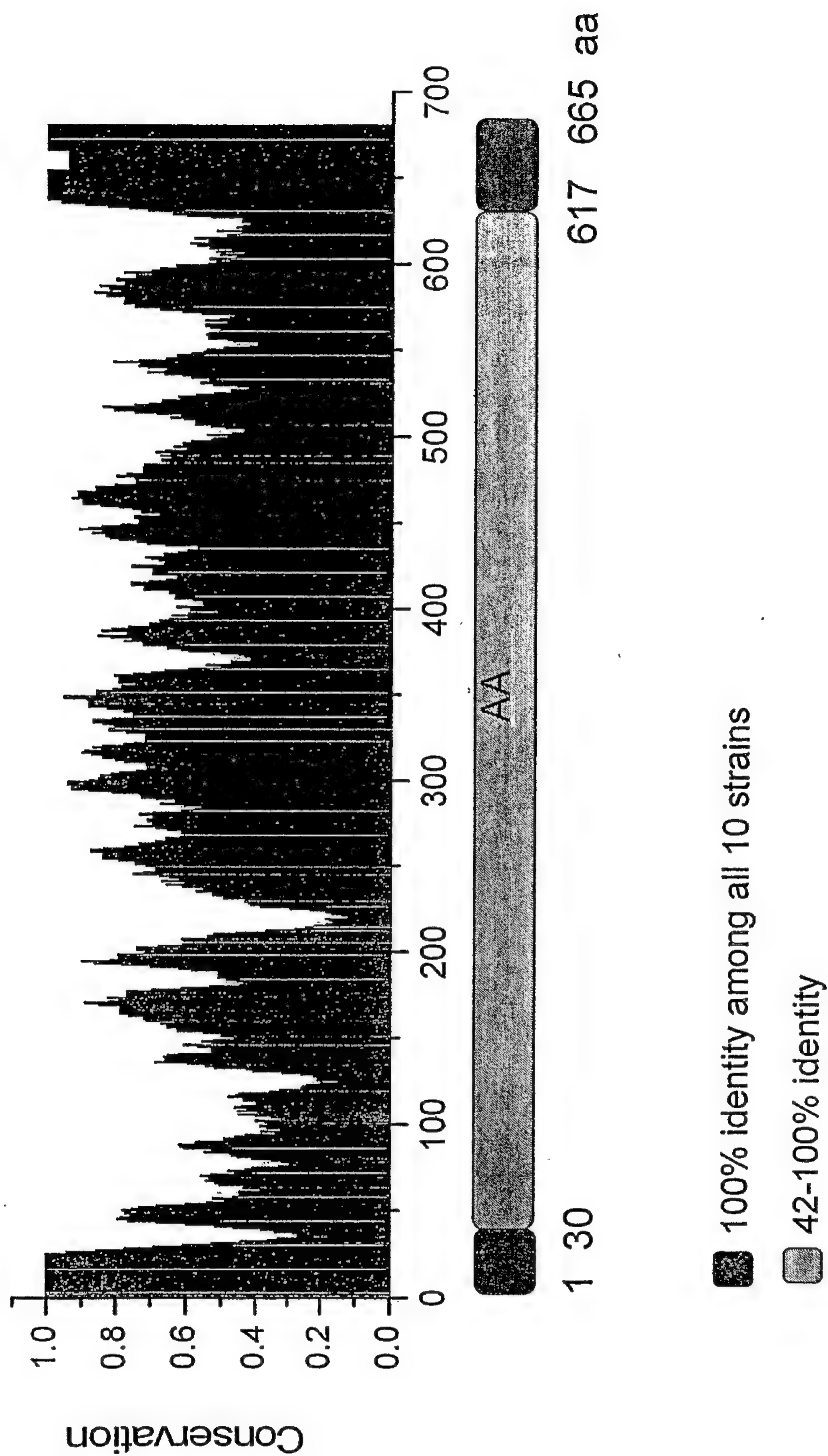


Figure 149

A

MLNRETHMKVKRIFQKAVAGLCCISQLTAFSSIVALA*ETPETS~~PAIGKVV~~IKETGEGGALLGDAVFELKN
 NTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQQPVGYKPKSTKQWTVVEKNGRTTVQGEQVENREE
 ALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKA~~LNPNPYER~~VIPEGTL~~SKRIYQVNNLDDN~~QYGIEL
 TVSGKTVYEQKDKSVPLDVVILLDNSMSNIRNKNARRAERAGEATRSLDKITS~~SDSEN~~RVALVTYAS
 TIFDGTFTVEKGVADKNGKRLNDSLFWN~~YDQTSFTTNTKDYSYL~~KL~~TNDKNDIVEL~~KNKVPTEAEDHD
 GNRLMYQFGATFTQKALMKADEILTQQARQNSQKVIFHITDGVPTMSYPINFNHA~~TFAPSYQN~~QLNA
 FFSKSPNKDGILLSDFITQATSGEHTIVRGDGGQSYQMFTDKTVYEKGAPAAFPVKPEKYSEMKAAGYAVI
 GDPINGGYIWLNWRESILAYPENSNTAKITNHGDPTRWY~~YNGNIAPDGYDVFTV~~GIGINGDPGTDEATA
 TSFMSISSKPENYTNVTD~~TTKILEQLNR~~YFHTIVTEKKSIENGTTIDPMGELIDLQLGTDGRFDPADYTL
 TANDGSRLENGQAVGGPQNDGGLLKN~~AKVLYDTTEKRIRVTGLYL~~GTDEKVTLTYNVRLNDEFVSNKFYD
 TNGR~~TTLHPKEVEQNTVRDFFPKIRDVRKY~~PEITISKEKKLG~~DI~~E~~FIKVNKN~~DKKPLRGAVFSLQKQHPDY
 DIYG~~AIDQNGTYQNVRTGEDGKLTFKNLSDGKYRL~~FENSEPAGYKPVQNKPIVAFQIVNGEVRDVT~~SIVPQ~~
 DIPAGYEFTNDKH~~YTTNEP~~PPKREY~~PRTGGIGMLPFYLIGCMM~~MGVLLYTRKHP

B

5' cgggatacc-gaa-acg-cct-gaa-acc-agt 5' 24mer, 54 %G+C, Tm 62

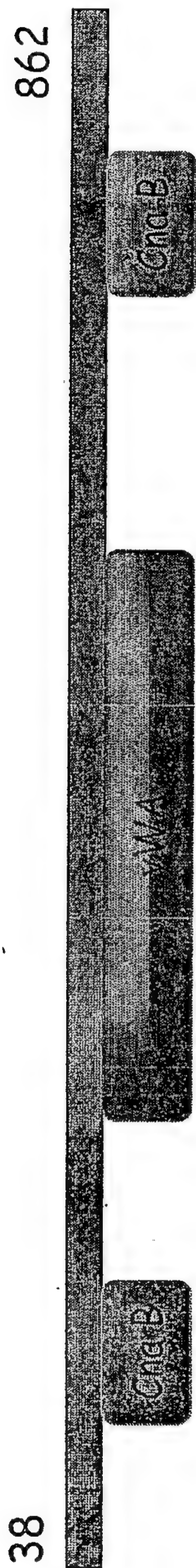
*Bam*HI

3' ccgctcgag-aat-agg-ttc-att-ggt 3' 27mer, 52 %G+C, Tm 61.6

*Xho*I

Figure 150

A.



B.

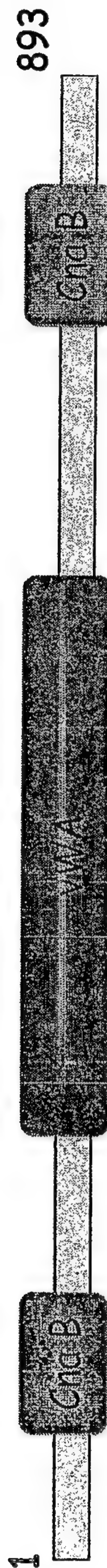
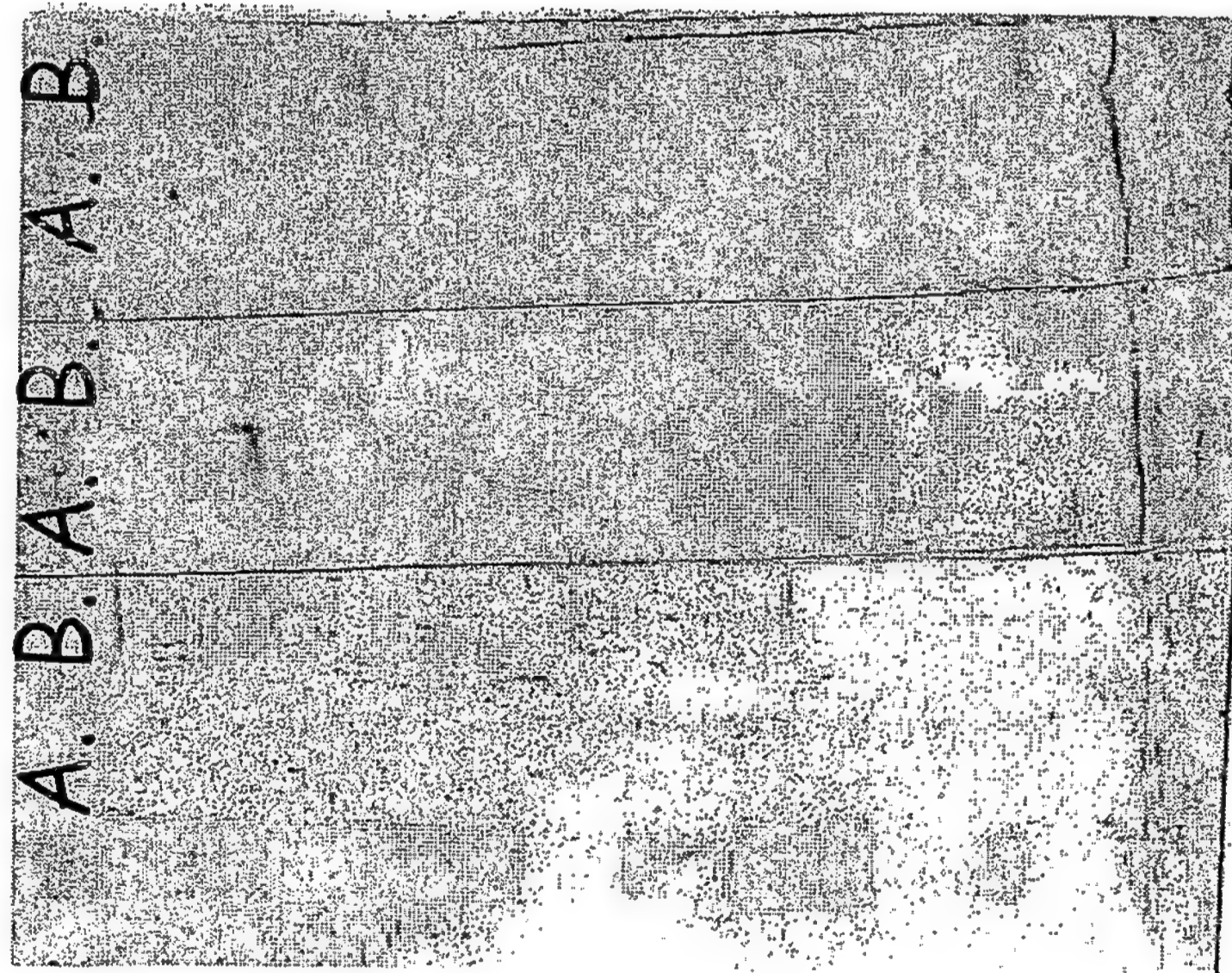


Figure 151

Figure 152

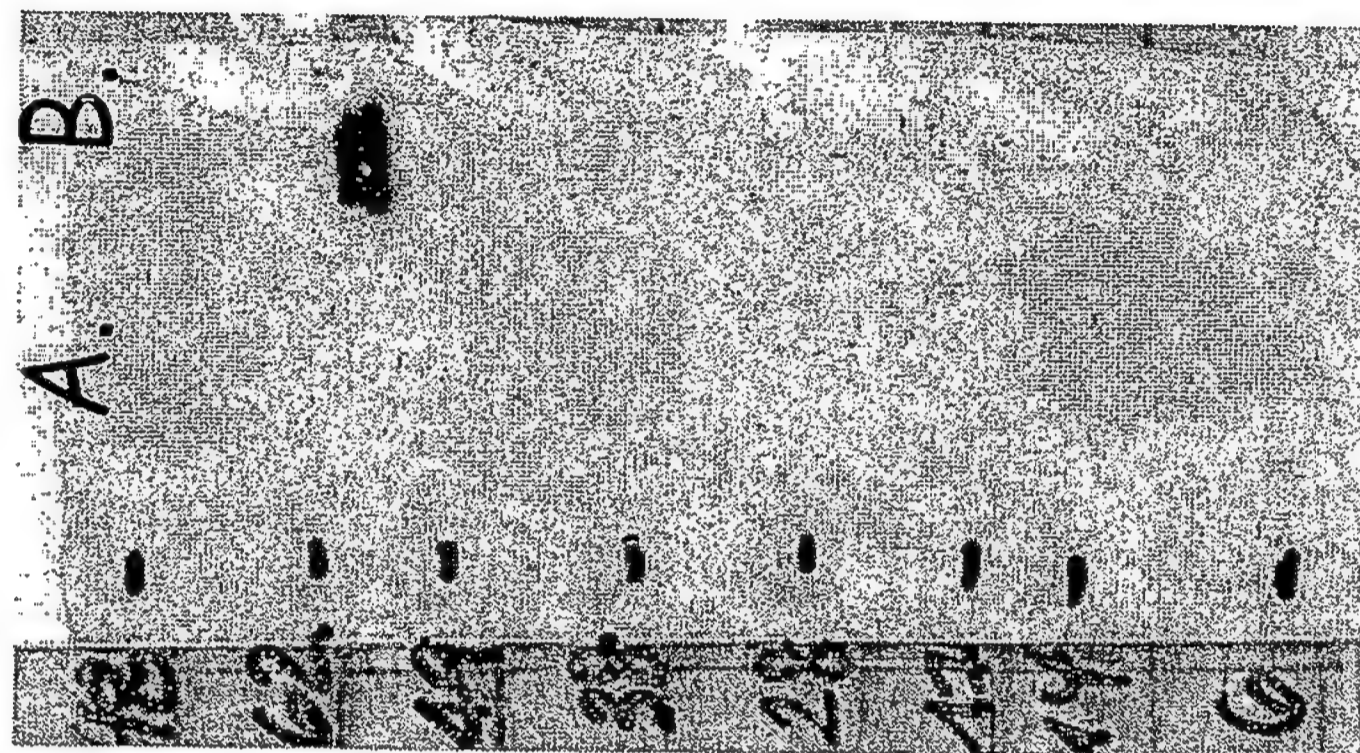
 α -pooled serum

α -gs-80



1:100	1:50	1:10
1:100	1:50	1:10

- rRRGC
- *E.coli* expressing rrgC



- rRGC
- GB5-80

351/487

A

MKSINKFLTMLAALLLTASSLFS*AATVFAAGTTTTSVTVHKLLATDGDMDKIANELETGNYAGNKVGVLPPA
 NAKEIAGVMFVWNTNTNNEIDENGQTLGVNIDPQTFKLSGAMPATAMKKLTEAEGAKFNTANLPAKYKIY
 EHSLSYVGEDGATLTGSKAVPIEIELPLNDVVDAAHVYPKNTAKPKIDKDFKGANPDTPRVDKDTPVNHQV
 GDVVEYEIVTKIPALANYATANWSDRMTEGLAFNKGTVKVTVDVVALEAGDYALTEVATGFDLKLTDAGLAK
 VNDQNAEKTIVKITYSATLNDKAIVEVPESNDVTFNYGNNPDHGNTPKPNKNENGDLTLTKTWVDTATGAPIP
 AGAEATFDLVNAQTGKVVQTVTLTTDKNTVTVNGLDKNTYKFVERSIKGYADYQEITTAGELAVKNWKD
 ENPKPLDPTPEPKVVITYGKKFVKVNDKDNRLAGAEFVIANADNAGQYLARKADKVSQEEKQLVVTTKDALDRAV
 AAYNALTAQQQTQQEKEKVDKAQAAYNAAVIAANNAFEWVADKDNENVVKLVSDAQGRFEITGLLAGTY
 YLEETKQPAGYALLTSRQKFEVTATSYSATGQGIEYTAGSGKDDATKVVNKKITIPQTGGIGTHFAVAGAAI
 MGIAYYAYVKNKDEDEQLA

B

5' cgggatacc-gct-gca-aca-gtt-ttt 3' 23mer, 52.2% G+C, Tm 60.6
*Bam*HI
 5' ccgcctcgag-agt-gat-ttt-ttt-gtt-gac 3' 26mer, 44.4% G+C, Tm 61.7
*Xho*I

Figure 153

PCT/US05/27239 352/487

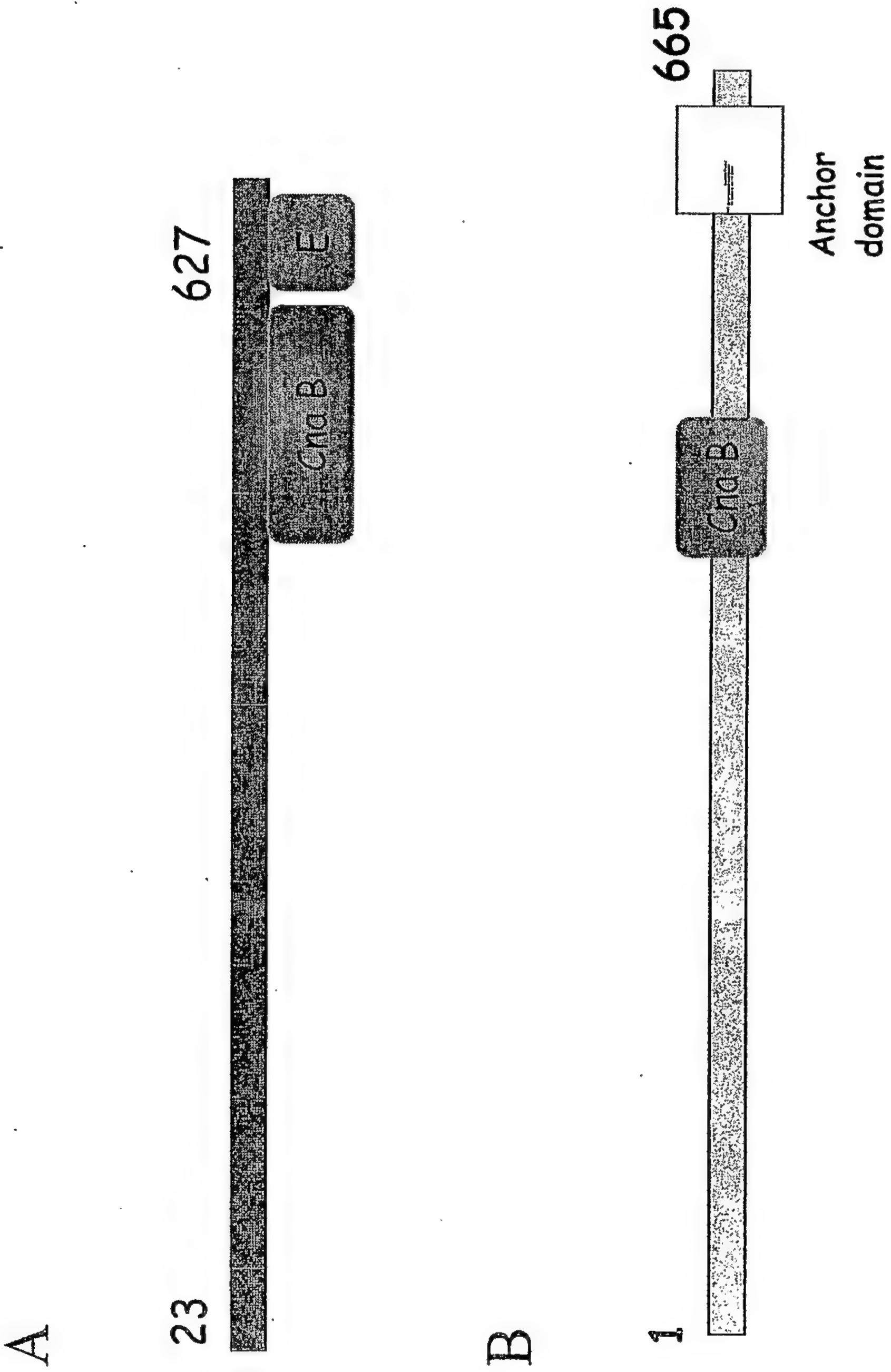


Figure 154

PCT/US05/27239

353/487



60 kDa
←

Figure 155

PCT/US2005/027239

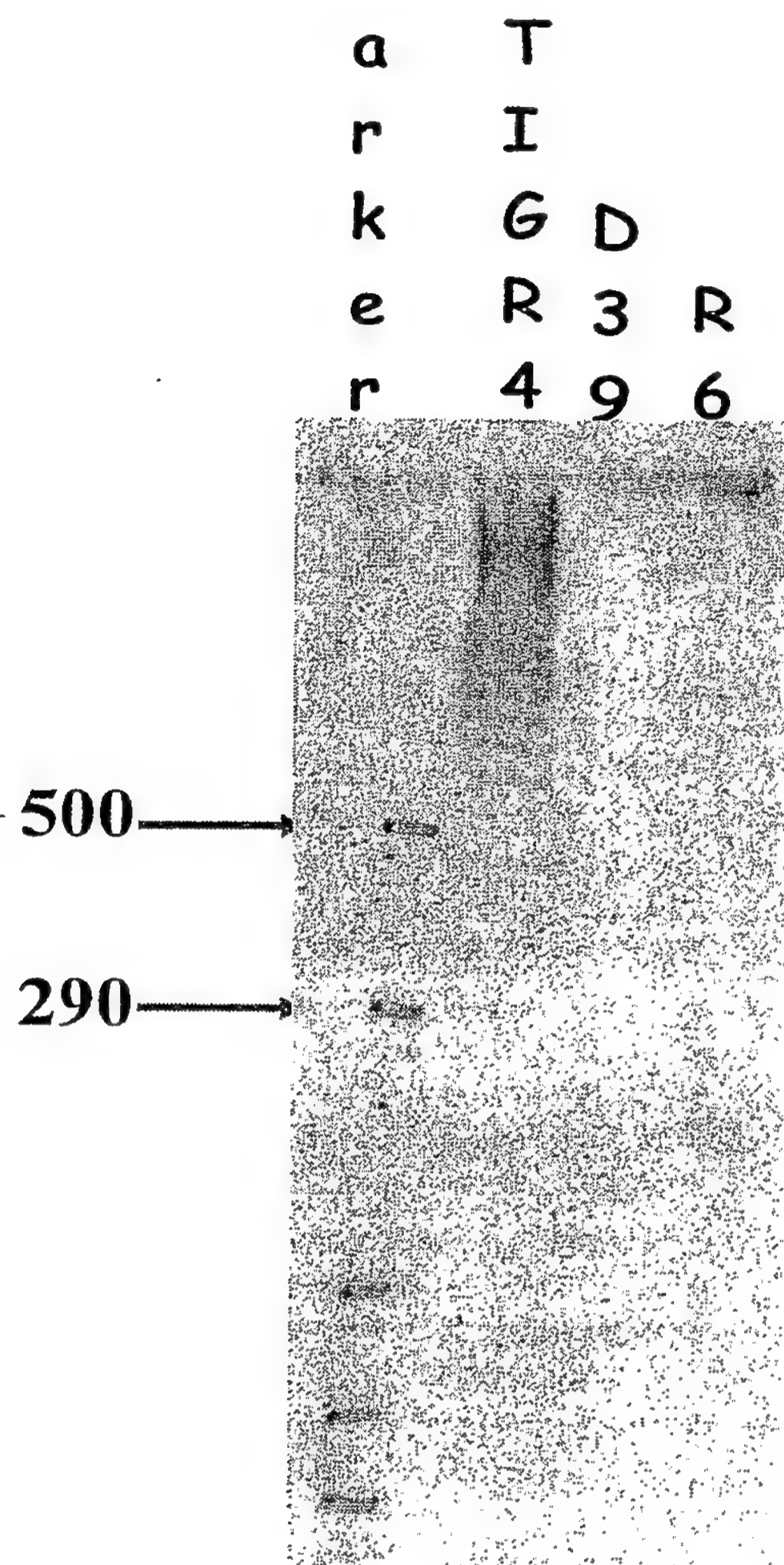


Figure 156

355/487

A

MISRIFFVMALCFSLVWGA*HAVAQAE~~DHTL~~VLQENYQEVVSQ~~PSRD~~GHRLQVWKLDDSYS
 YDDR~~VQIV~~RDLHSWDENKLS~~SFKKTS~~FEMTFLENQIEVSHIPNGLYYVRSIIQTD~~AVSYP~~AEFLF
 EMTDQTVEPLVIVAKKTD~~MTTKV~~KLKVDQDHNRL~~EGVG~~FKLVSVARDVSEKEVPLIGEYRYSS
 GQVGR~~TL~~YTDKNGEIFVTNPLGNYR~~FKEVE~~PLAGYAVTTLDVQLVDHQLVTTTVVNQKLPRGN
 VDFMKVDGR~~TNTSL~~Q~~GAM~~FKVMKEESGHYTPVLQNGKEVVVTS~~GKDGR~~FRVEGLEYGTYYLWELQ
 APTGYVQLTSPVSFTIGKDTRKELVTIVVKNNK~~RPR~~IDVPDTGEETLYILMLVAILLFGSGYYLT~~TKKP~~
 NN

B

5' cggaacc-cat-gca-gtc-caa-gcg-caa-gaa-21mer, 61% G+C, Tm 60.8

*Bam*HI

5' ccgcctcgag-ctt-gtt-att-ftt-aac-cac-27mer, 44% G+C, Tm 58.4

*Xho*I

Figure 157

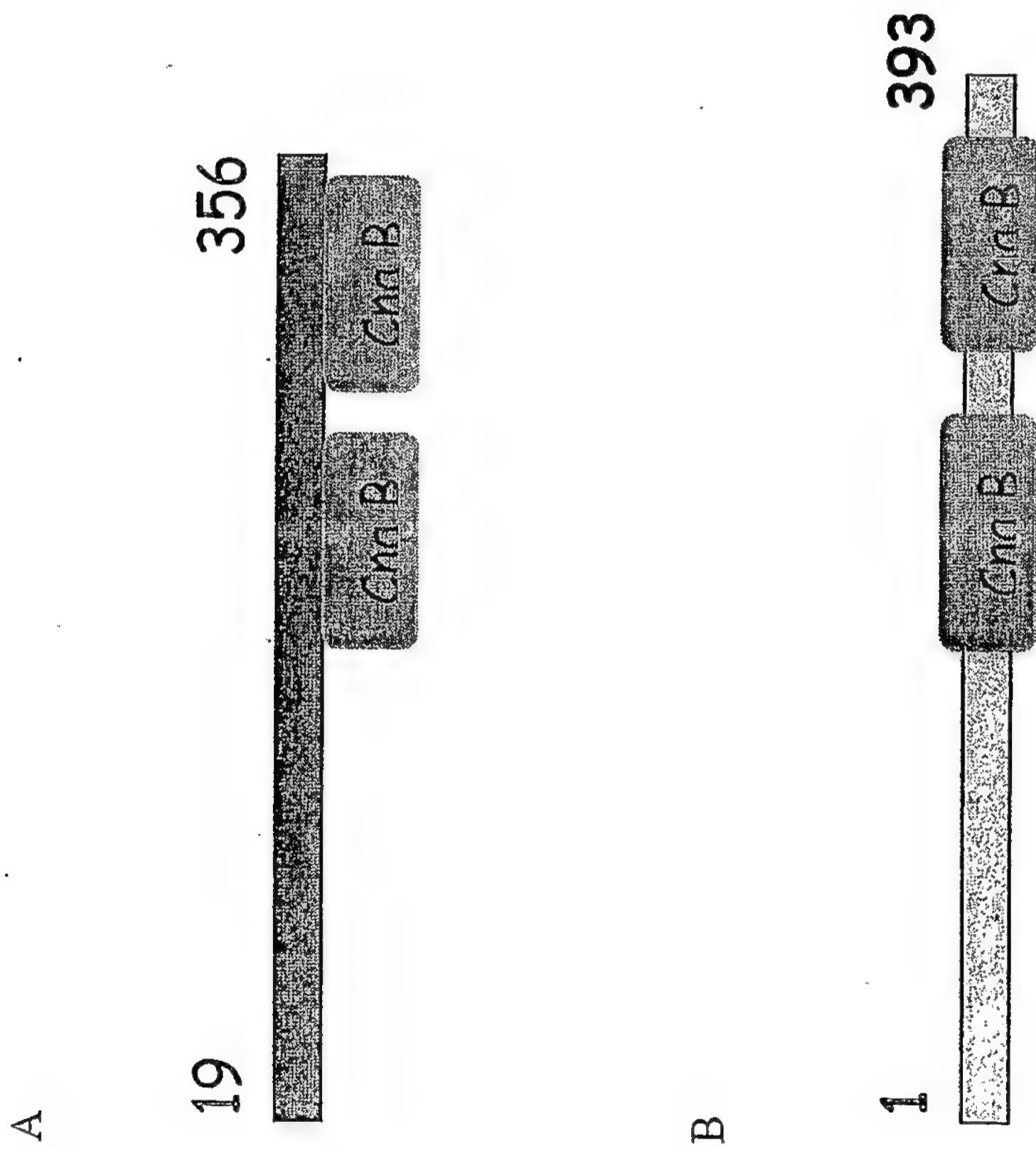


Figure 158

PCT/US05/27239 357/487

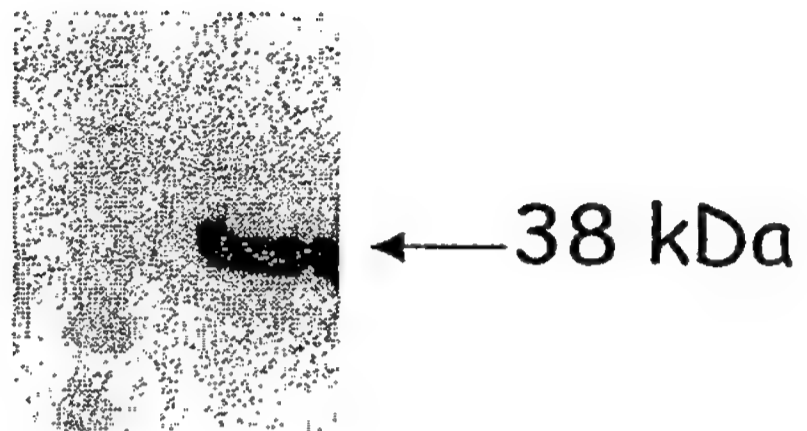


Figure 159

PCT/US05/27239

358/487

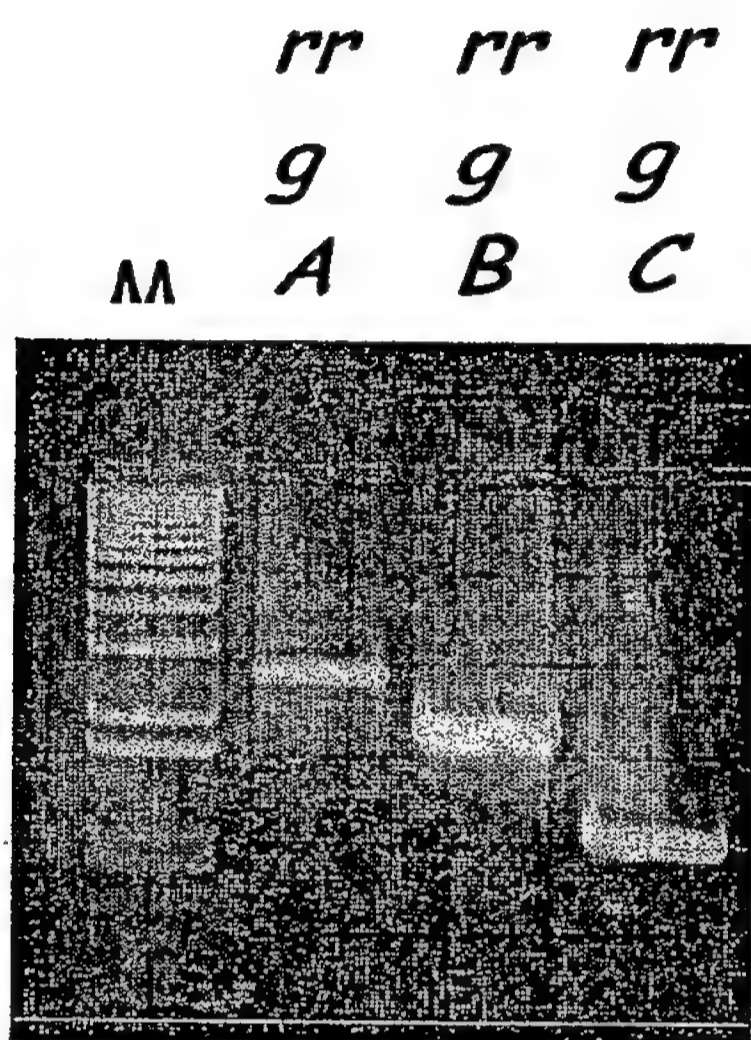
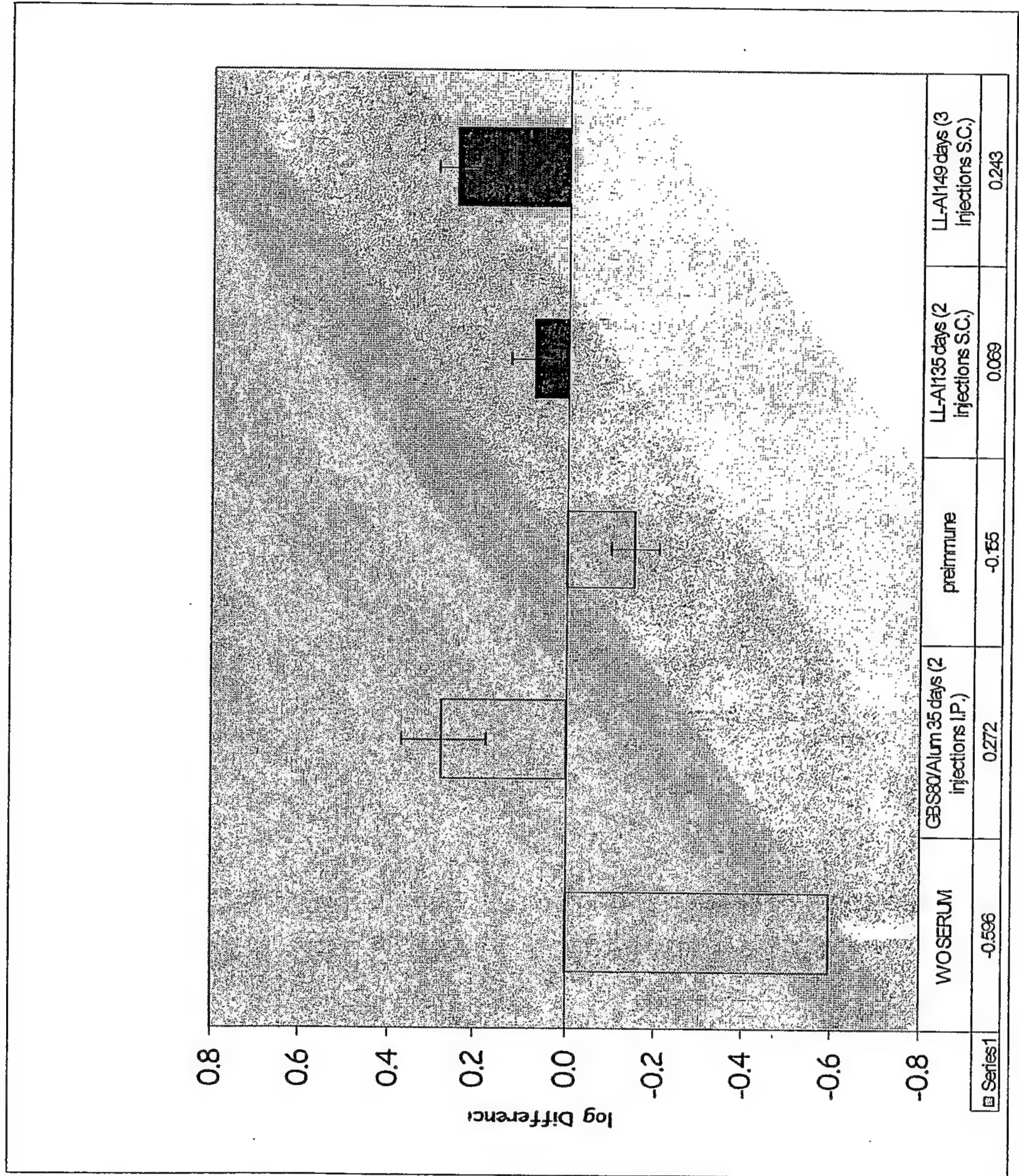


Figure 160

Figure 161



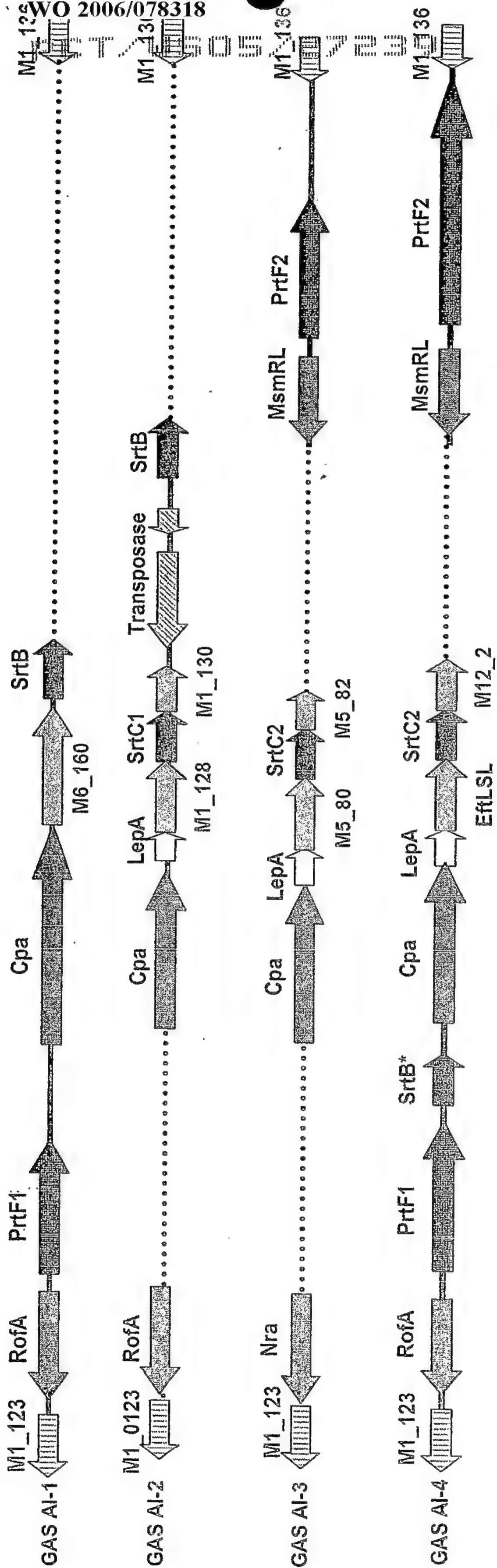
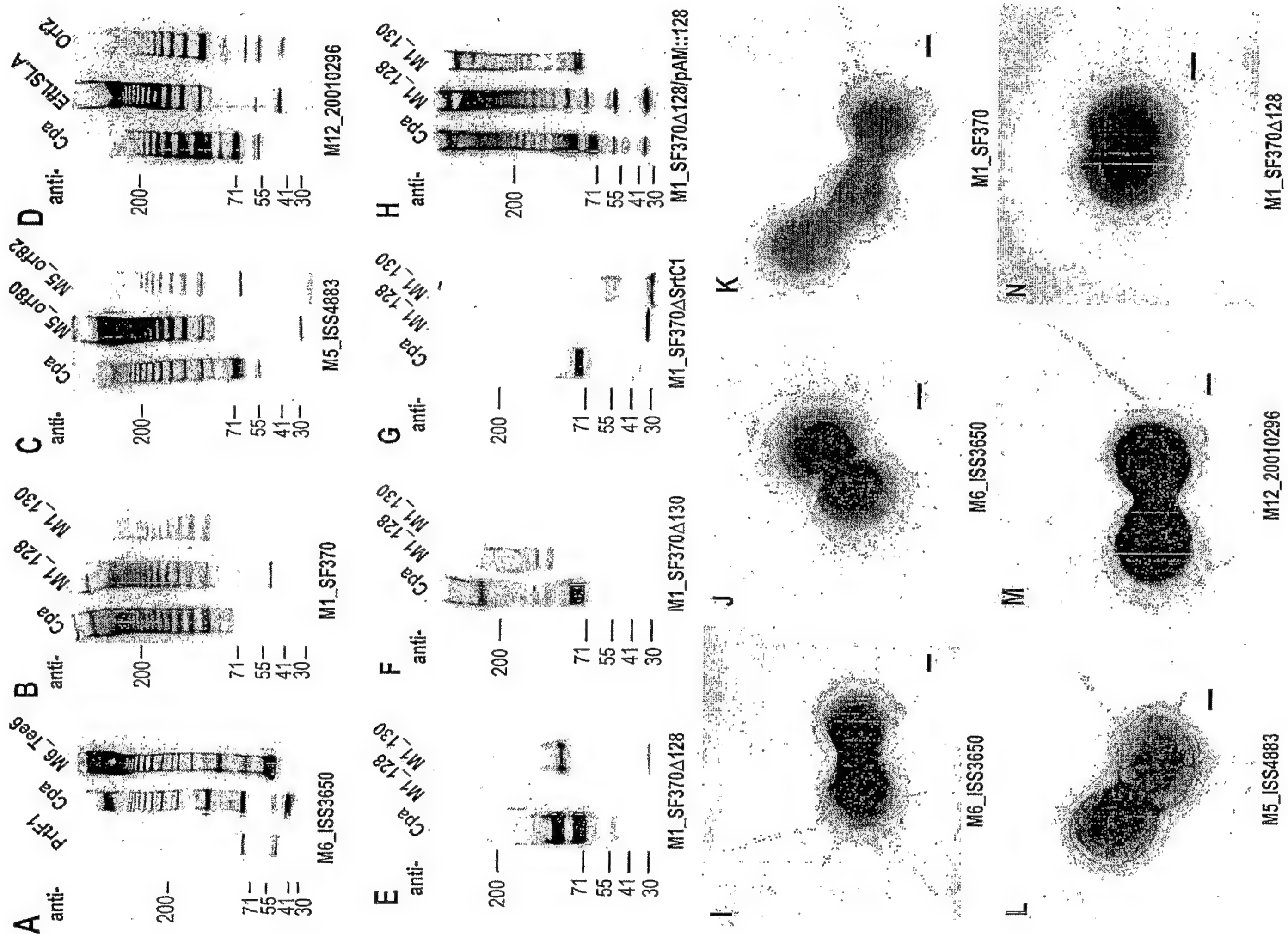


FIGURE 162

PCT/US2005/027239 361/487

Figure 163



PCT/US05/27239 362/487

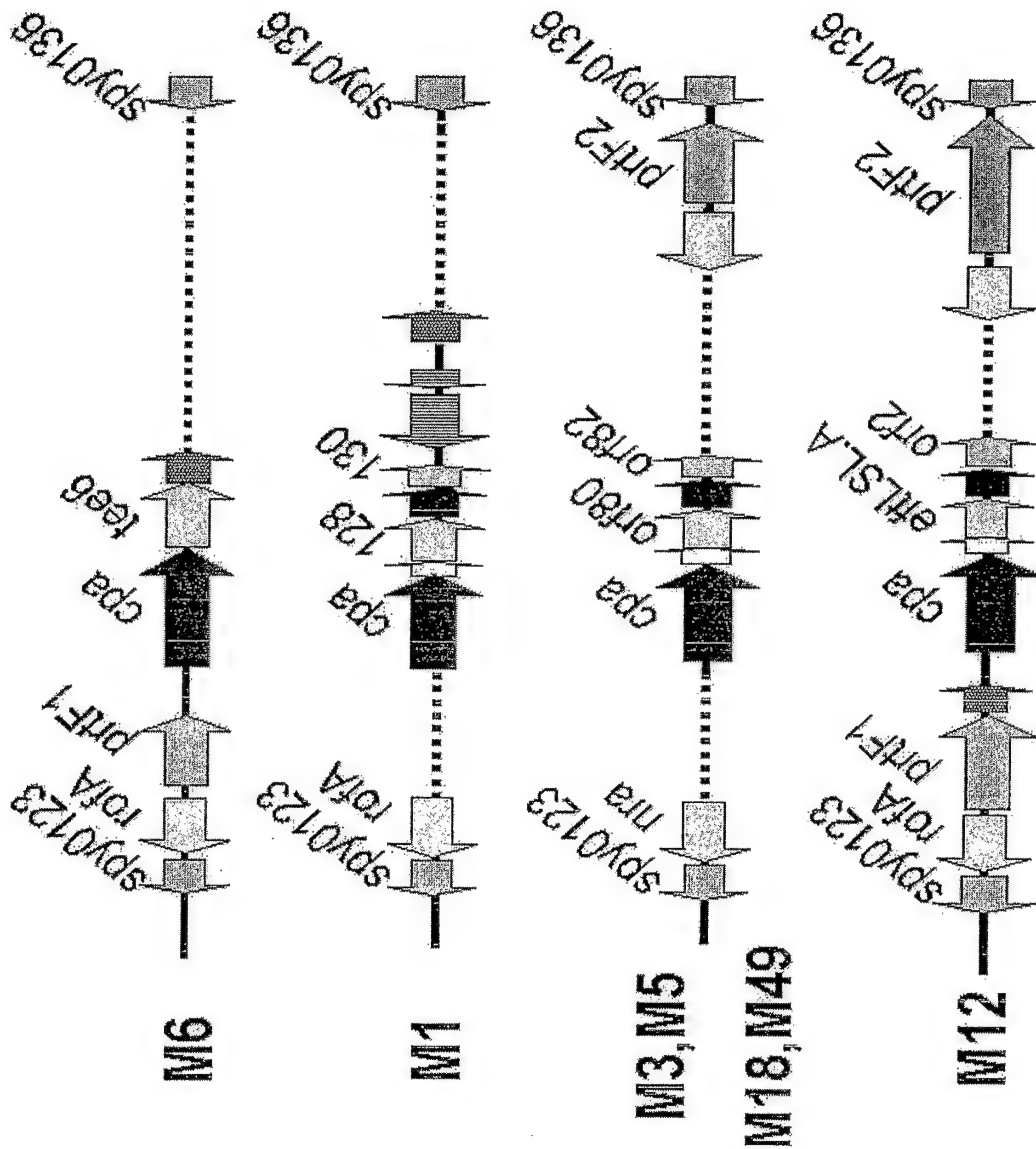


Figure 164

PCT/US05/27239 363/487

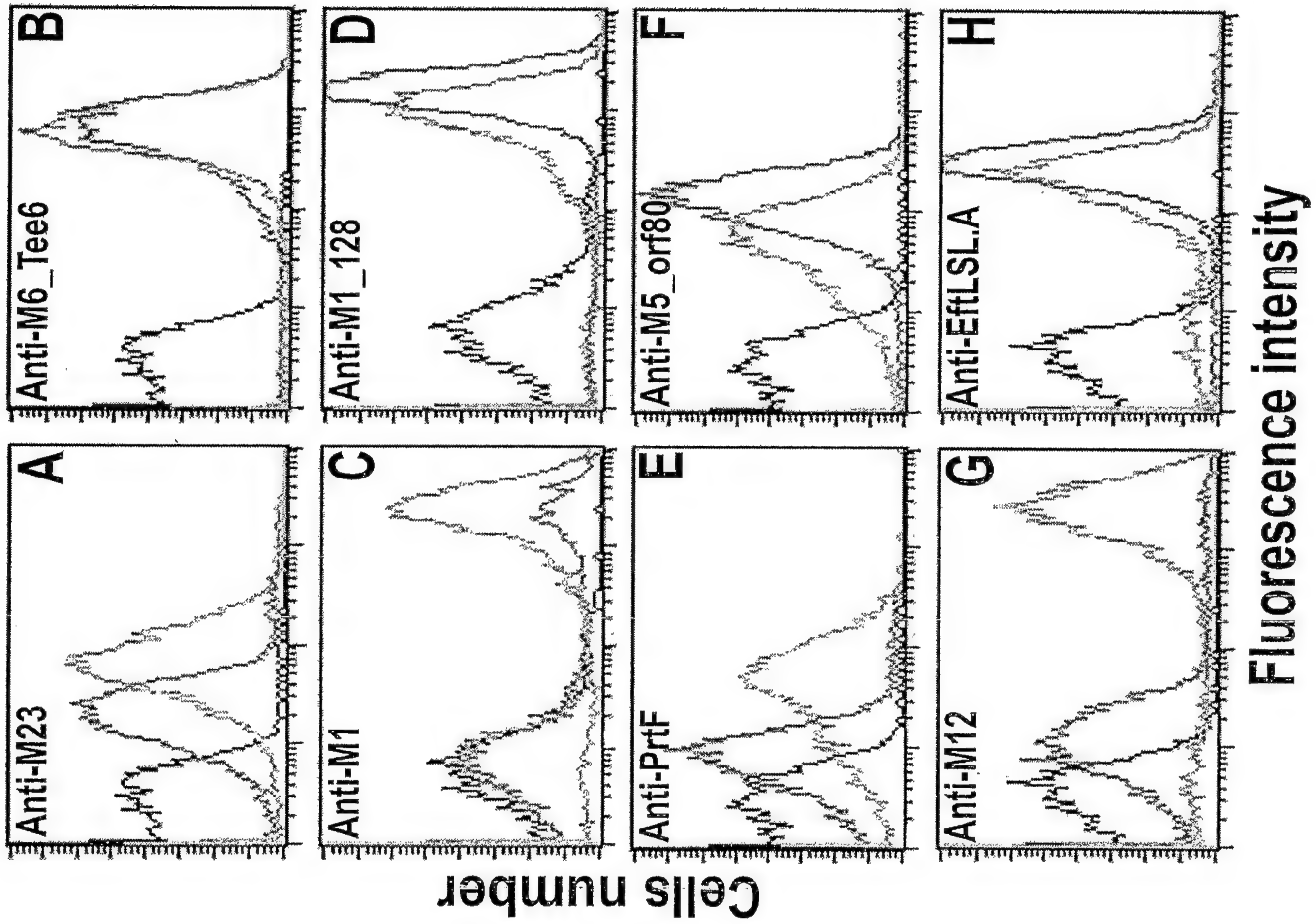


Figure 165

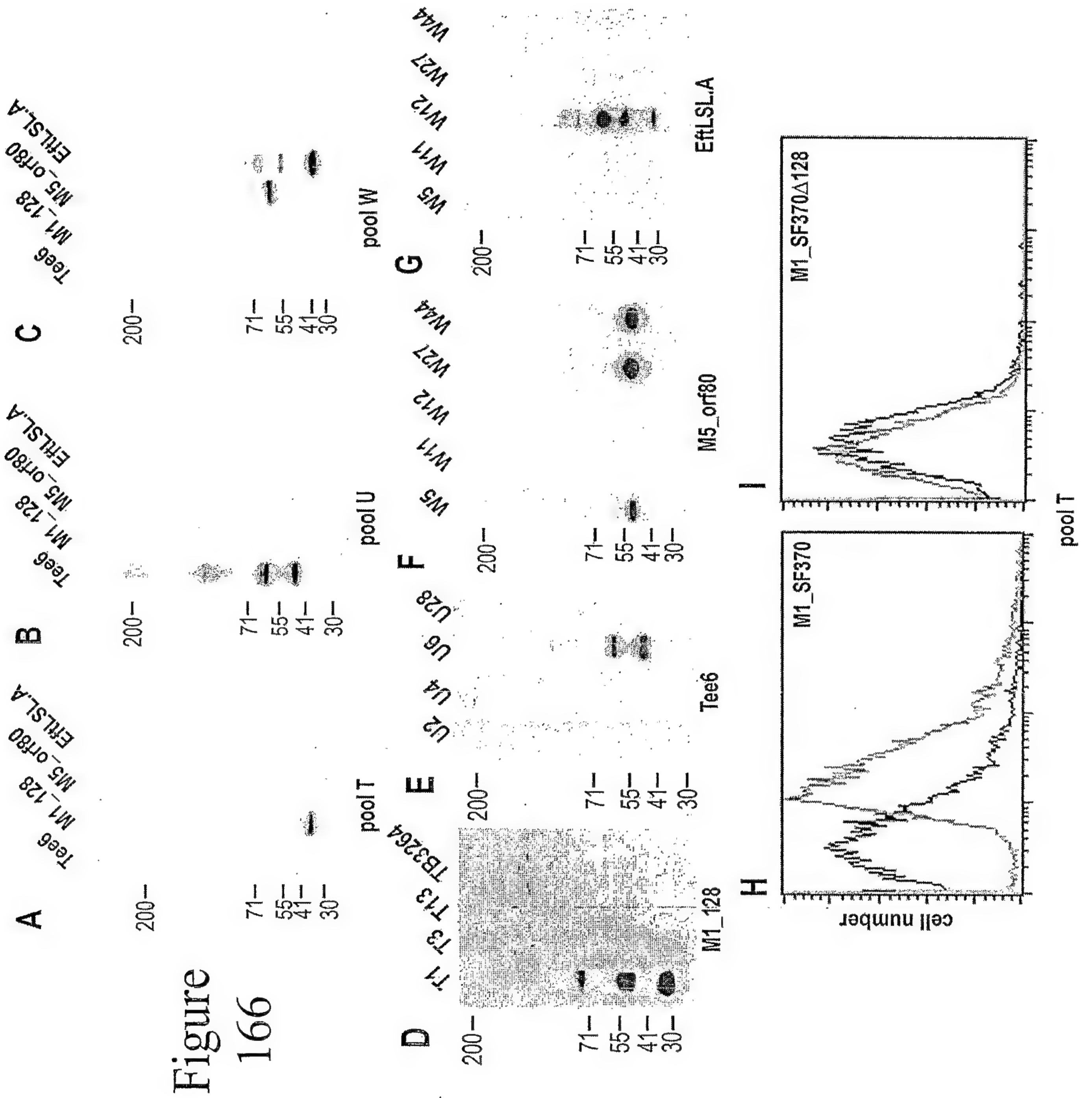


Figure 167

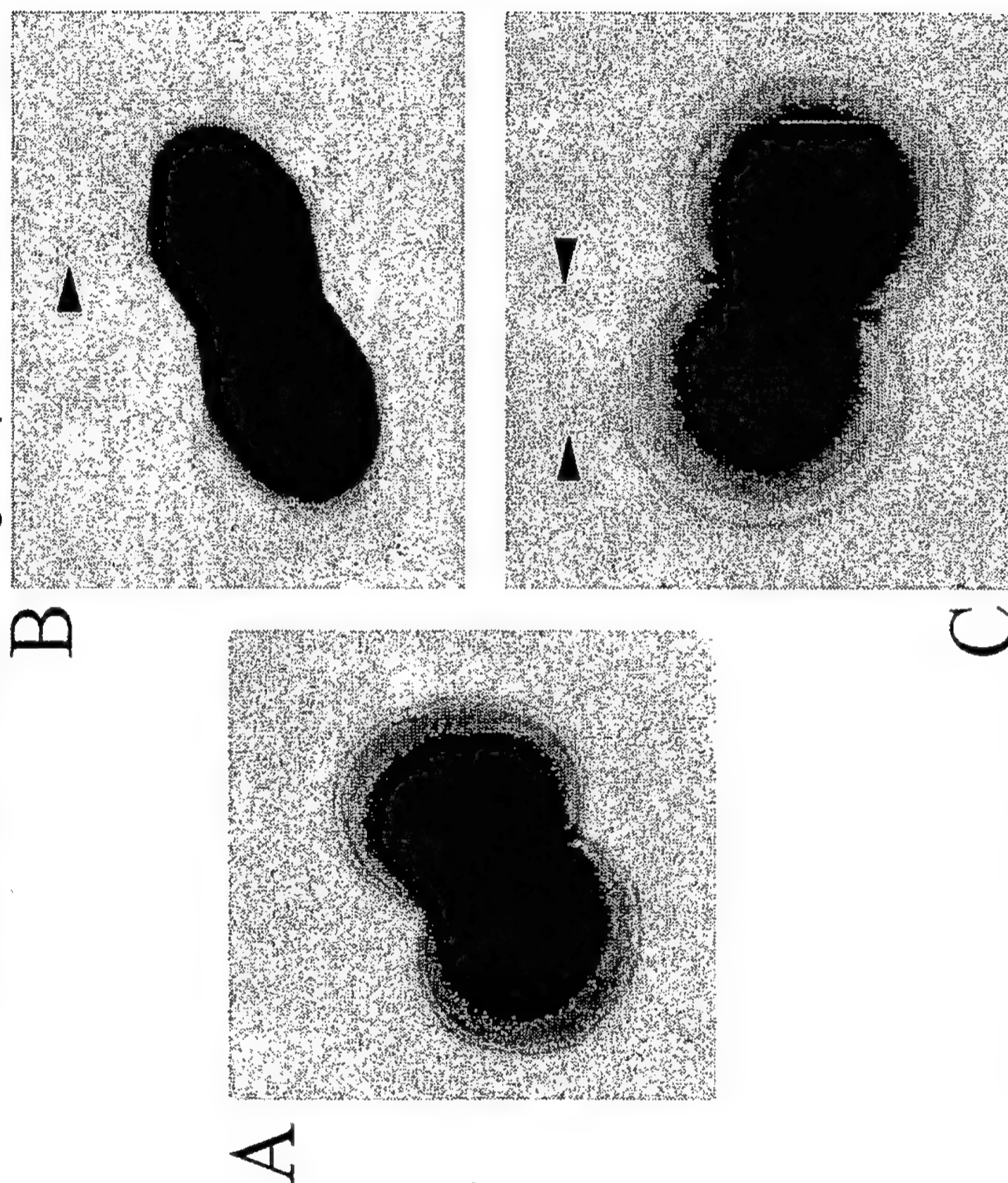
Strain	M-type	PCR					AI	Sequence
		SrtB	SrtC1	SrtC2	MsmRL	SipA2		
2724	6	+	-	-	-	-	1	
2894	6	+	-	-	-	-	1	
3650	6	+	-	-	-	-	1	
5529	6	+	-	-	-	-	1	
Dsm2071	23	+	-	-	-	-	1	+
SF370	1	+	+	-	-	-	2	literature
2580	1	+	+	-	-	-	2	
2913	1	+	+	-	-	-	2	
3280	1	+	+	-	-	-	2	
3348	1	+	+	-	-	-	2	
2719	?	+	+	-	-	-	2	
2721	3	-	-	+	+	+	3	
3040	3	-	-	+	+	+	3	
3135	3	-	-	+	+	+	3	
3776	44 ?	-	-	+	+	+	3	+
4959	77	-	-	+	+	+	3	+
4088	Clinical isolate	-	-	+	+	+	3	
2728	12	+	-	+	+	+	4	
2720	9	+	-	+	+	+	4	+
2727	11	+	-	+	+	+	4	+
4436	28	+	-	+	+	+	4	+
5481	44 ?	+	-	+	+	+	4	+
4538	50	+	-	+	+	+	4	+
3789	78	+	-	+	+	+	4	+
4883	5	+	+	+	+	+	4	
5476	89	+	-	+	+	+	4	
5495	?	+	-	+	+	+	4	
2722	4	-	-	-	-	-	?	
2723	5?	-	-	-	-	-	?	
2725	8	-	-	+	-	-	?	
2726	2	-	-	-	-	-	?	
2634	4	-	-	-	-	-	?	
5531	75	+	+	-	-	-	?	In progress

366/487

Figure 168

Immuno-electronmicroscopy

(Immunogold Negative Staining,
1° α - 80, 2° α -mouse gold particles 10nm)



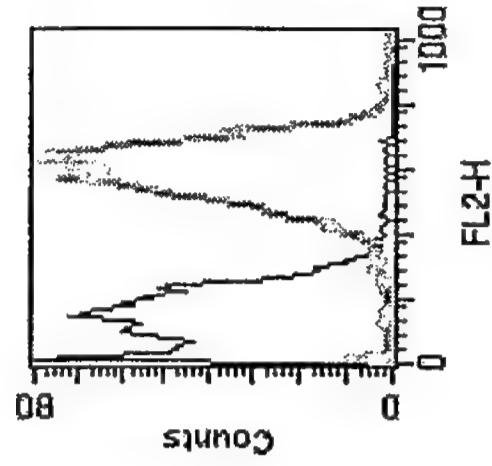
L. lactis -
L. lactis + AI-1 +

Figure 169

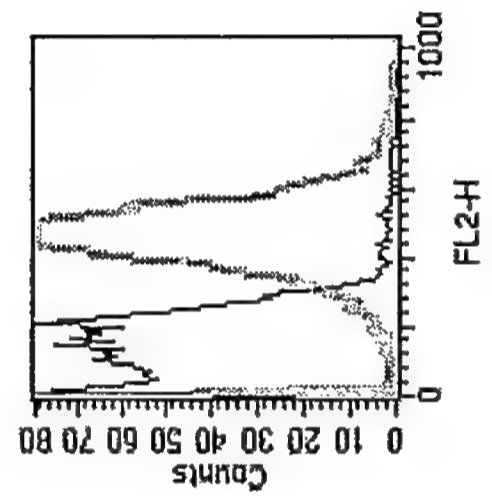
GBS JM9130013

L. lactis + AI-1

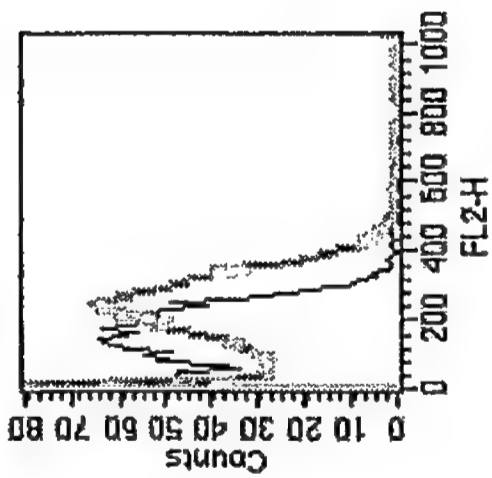
L. lactis



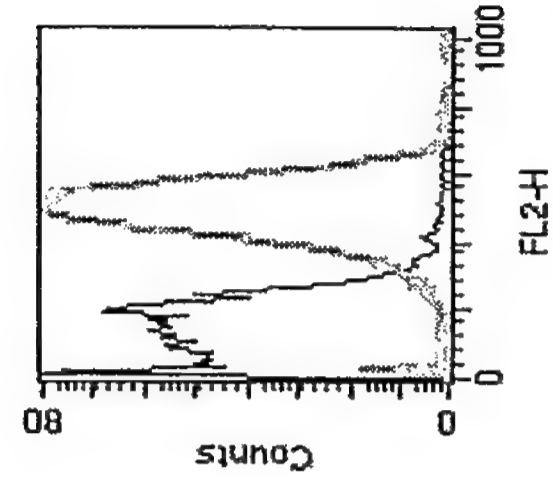
Δ Mean 461



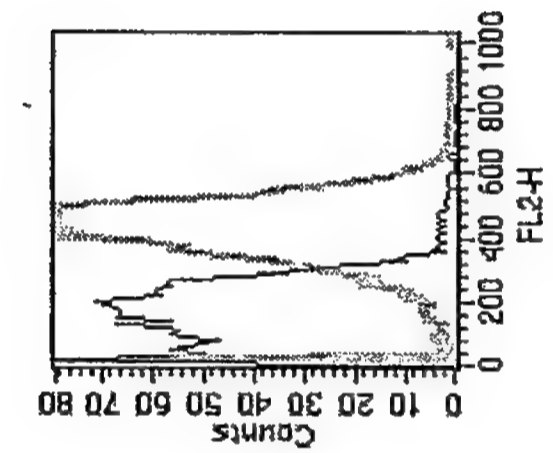
Δ Mean 298



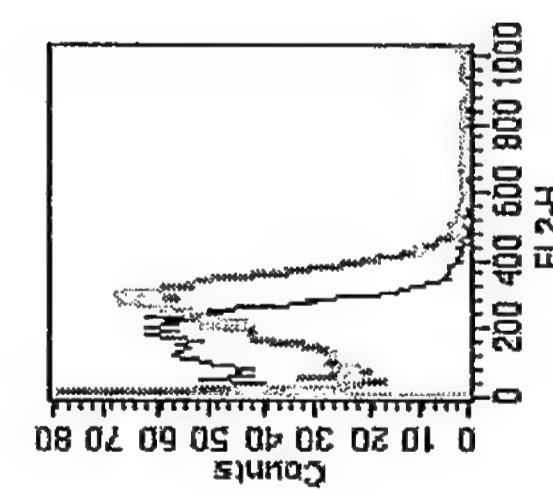
Δ Mean < 100



Δ Mean < 355



Δ Mean < 251



Δ Mean < 100

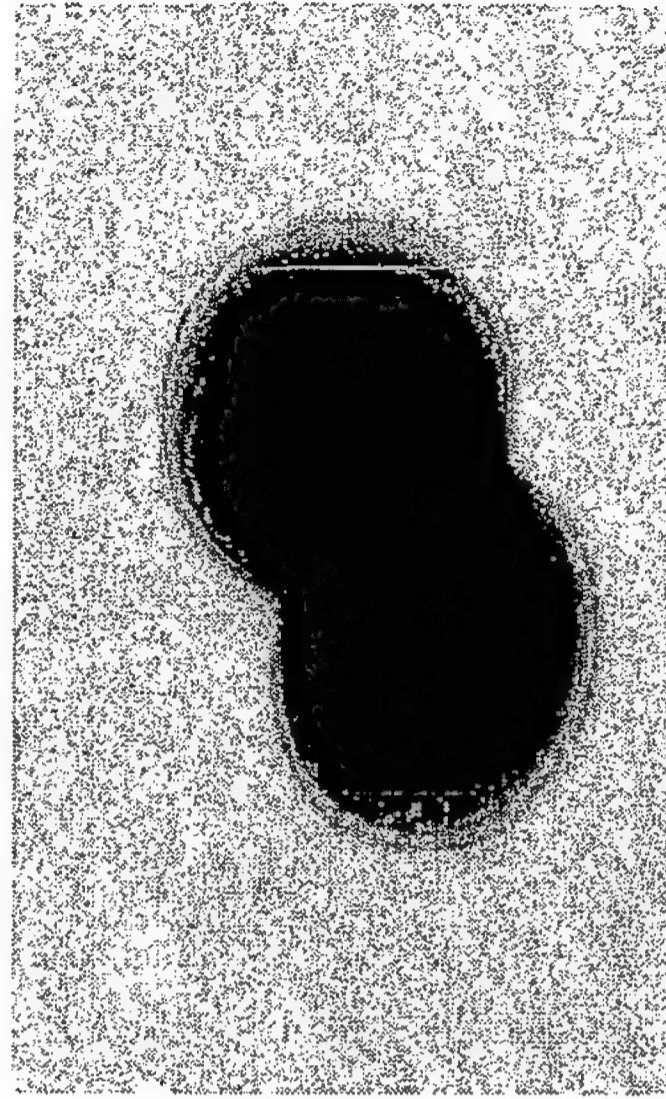
α -80

α -104

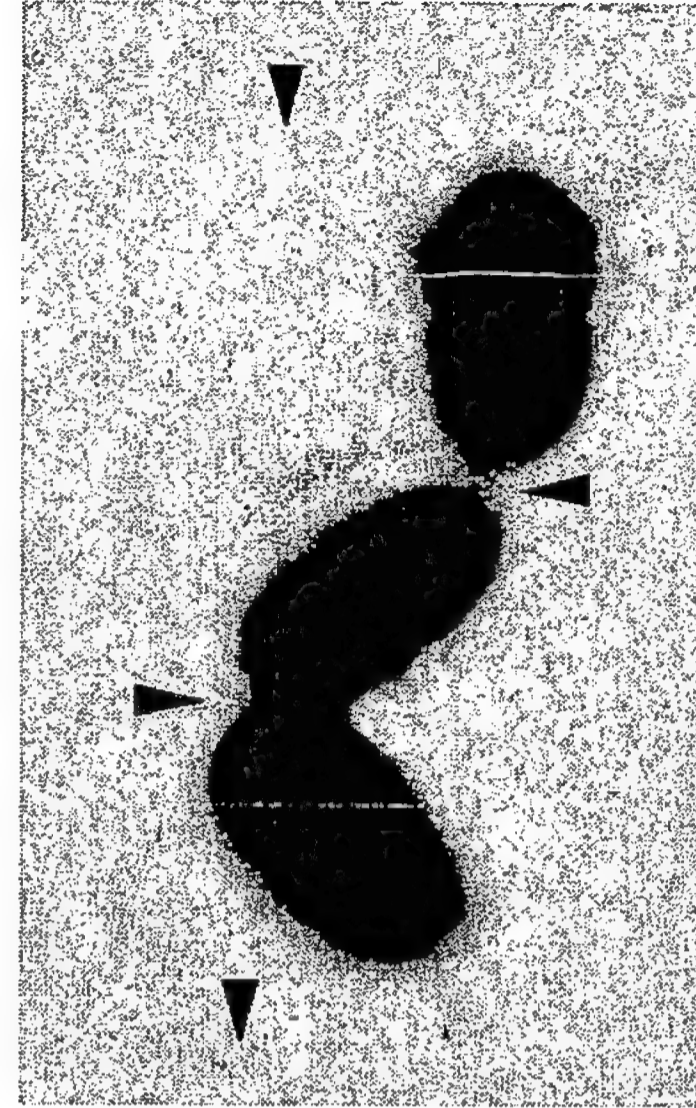
Figure 170

Phase contrast Microscopy **Immuno-electronmicroscopy**
 (Immunogold Negative Staining,
 1° α -80, 2° α -mouse gold particles 10nm)

L. lactis



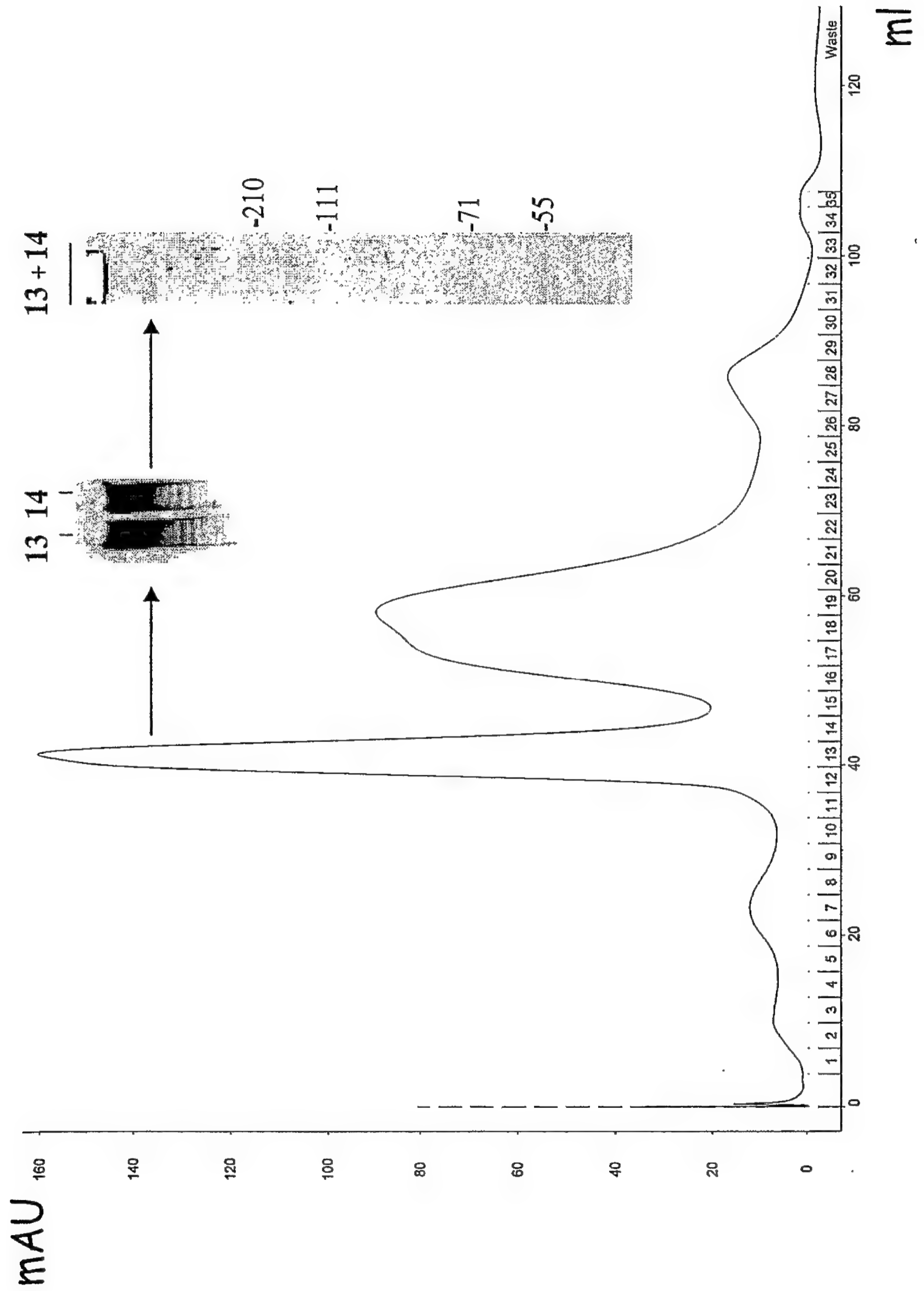
L. lactis + AI-1



PCT/US05/27239 369/487

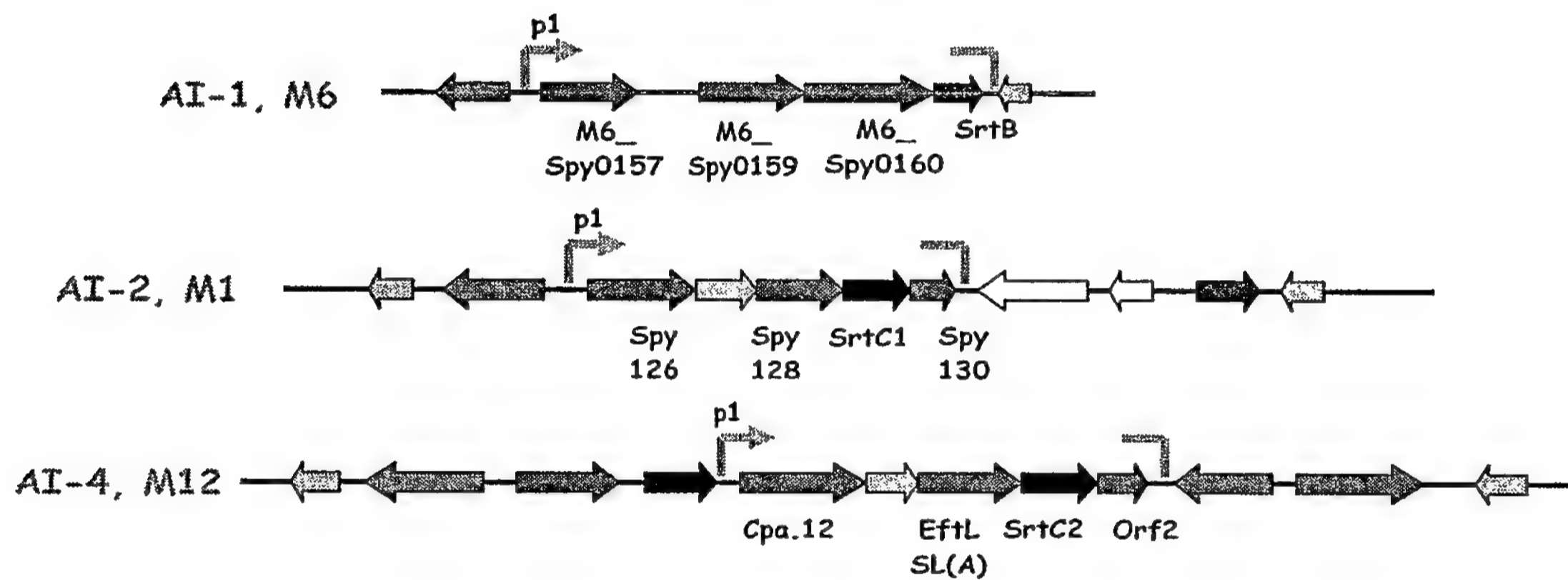
Figure 171

Gel filtration on Sepharyl HR 400



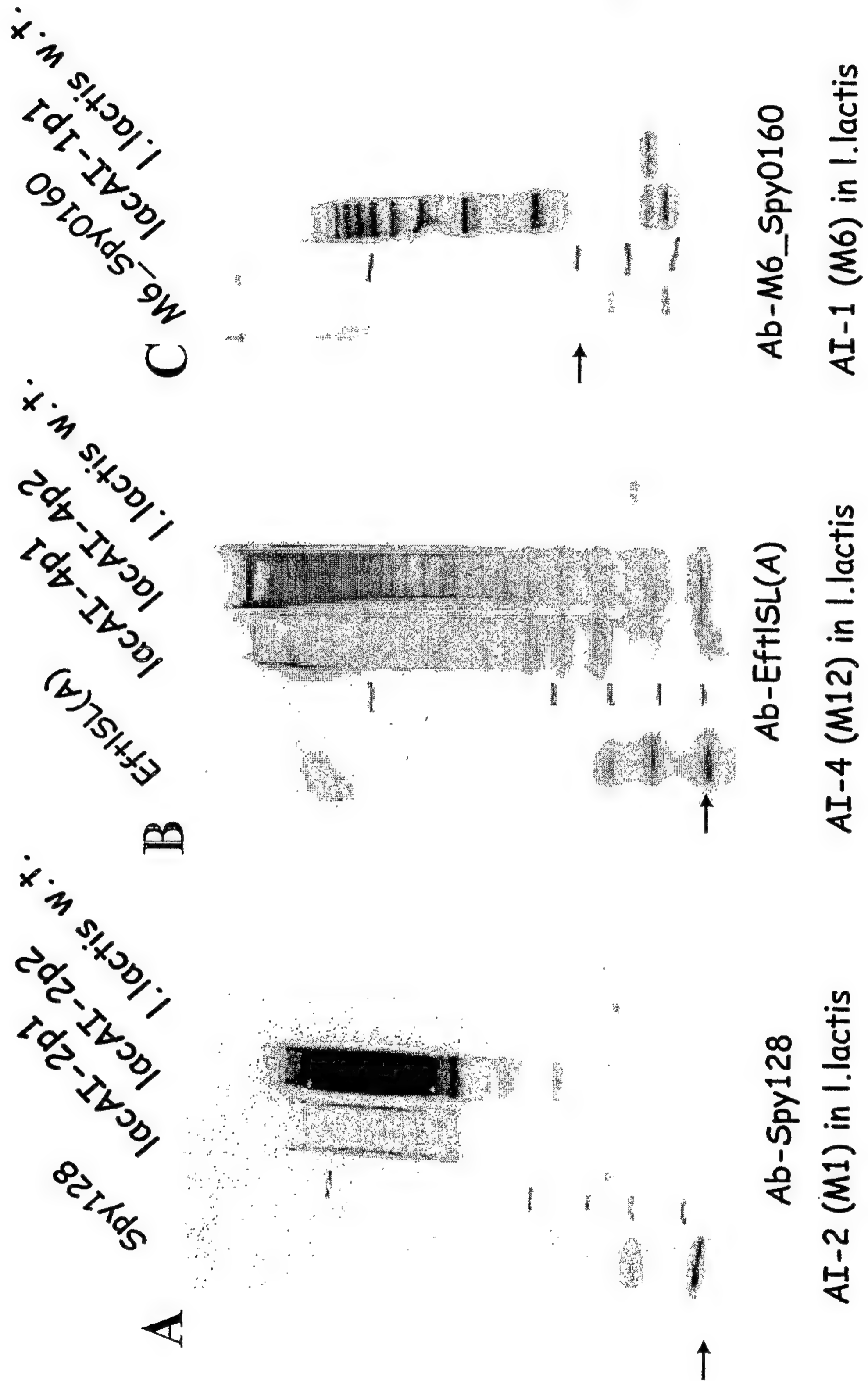
370/487

Figure 172



PCT/US05/27239 371/487

Figure 173

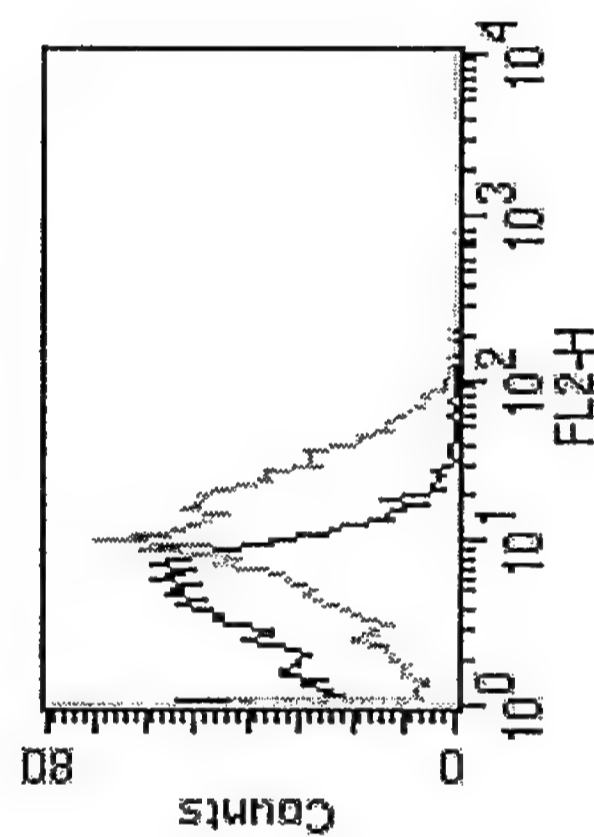


PCT/US05/27239

372/487

Figure 174

M6_Spy0157



PCT/US05/27239

373/487

Figure 175

Orf2

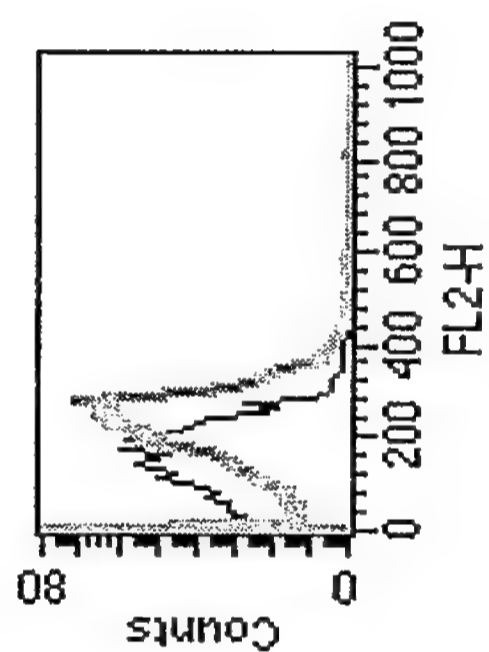
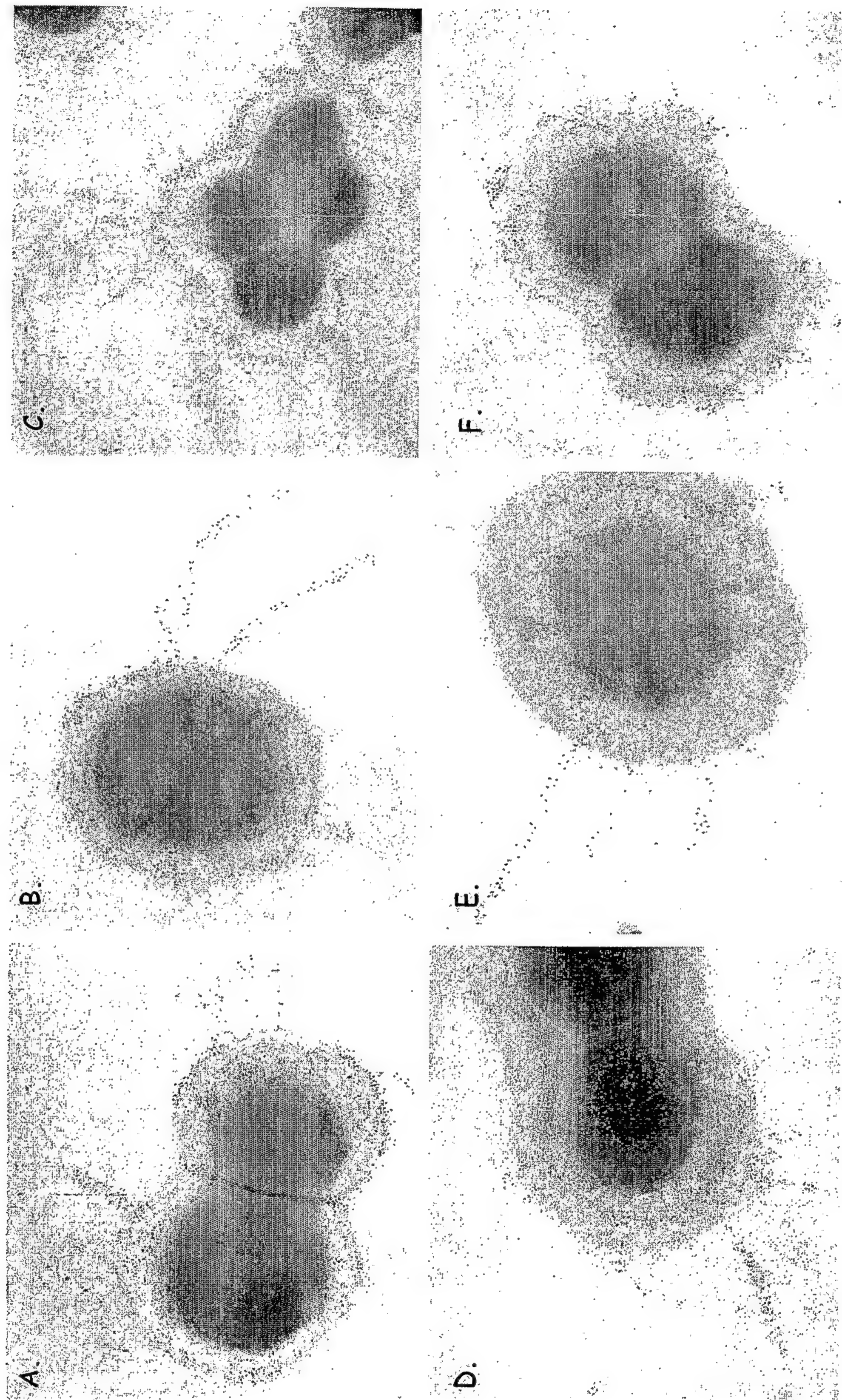


Figure 176



Immunogold labeling with antibodies against: A. B. C. D. E. M6_Spy0160; F. M6_Spy0159

Figure 177

WO 2006/078318

PCT/US2005/027239

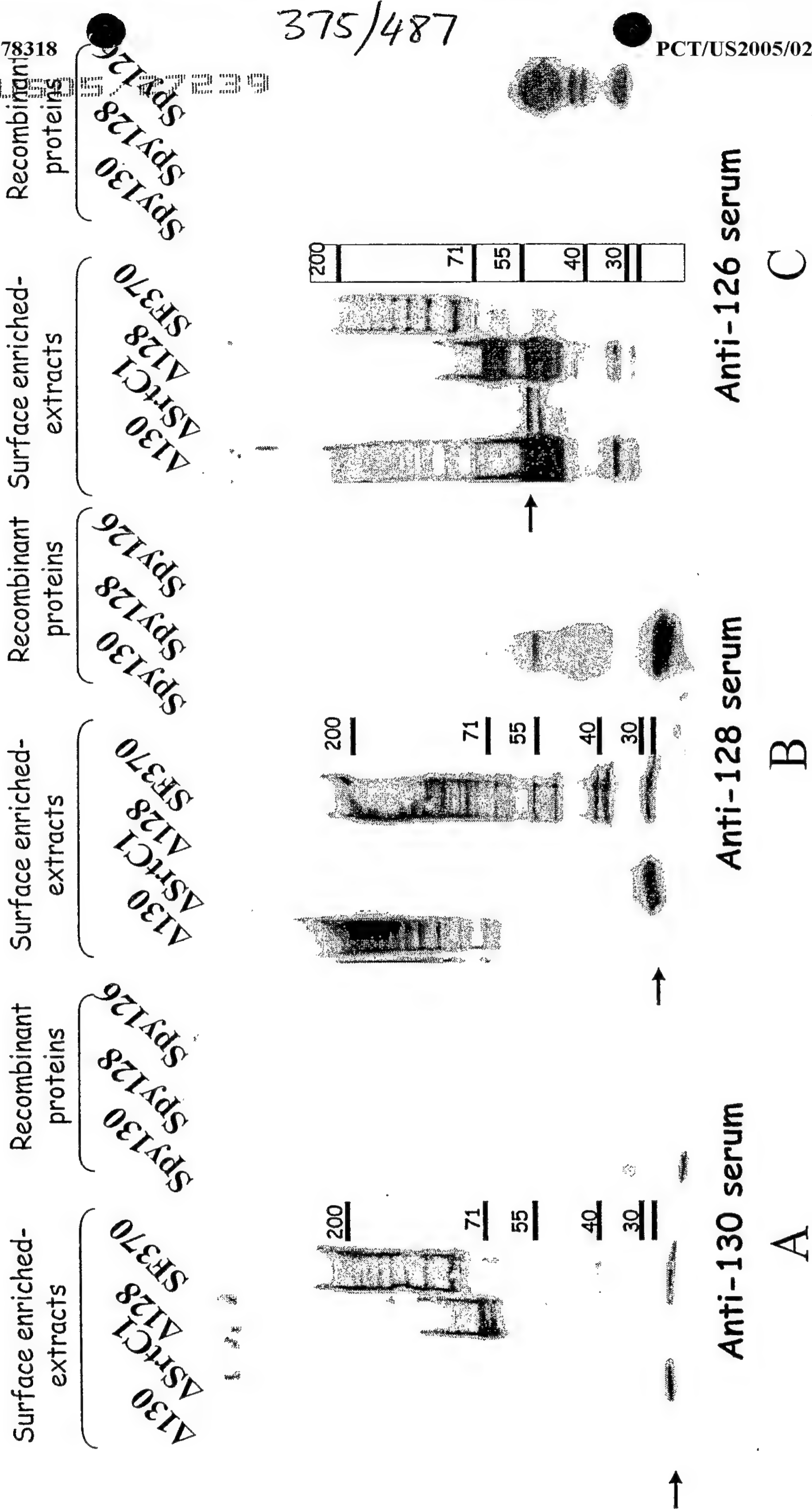
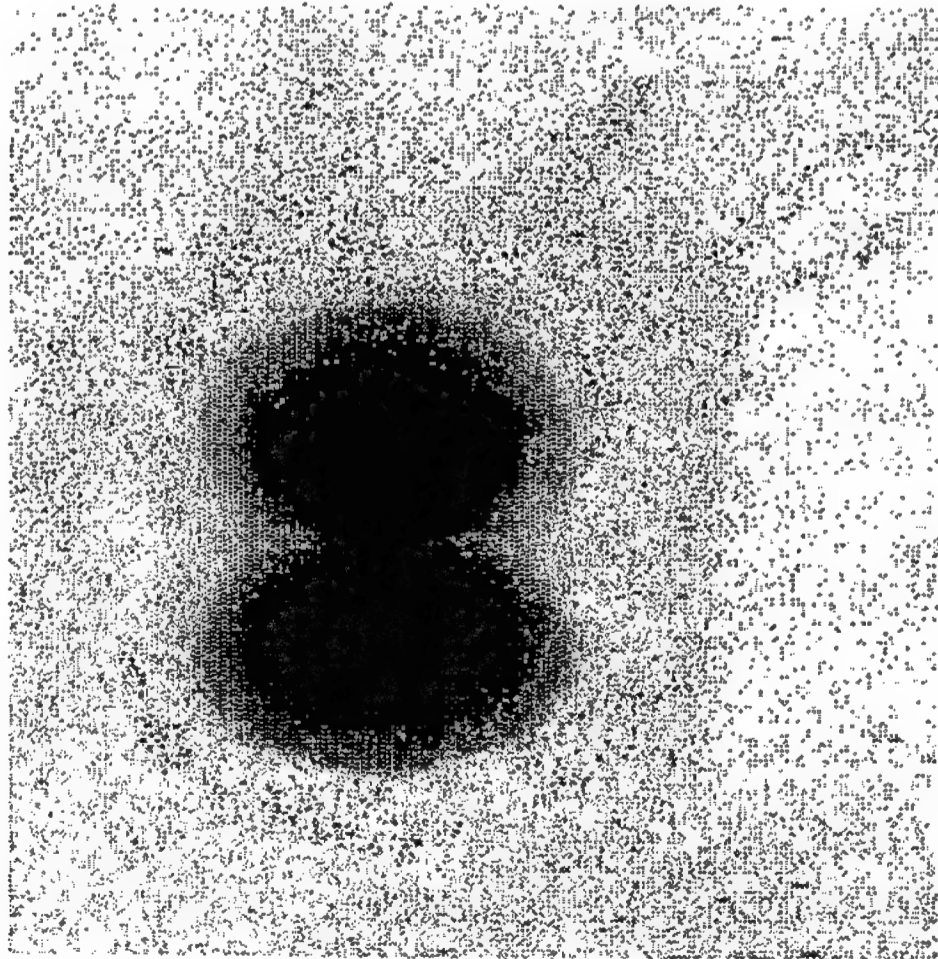


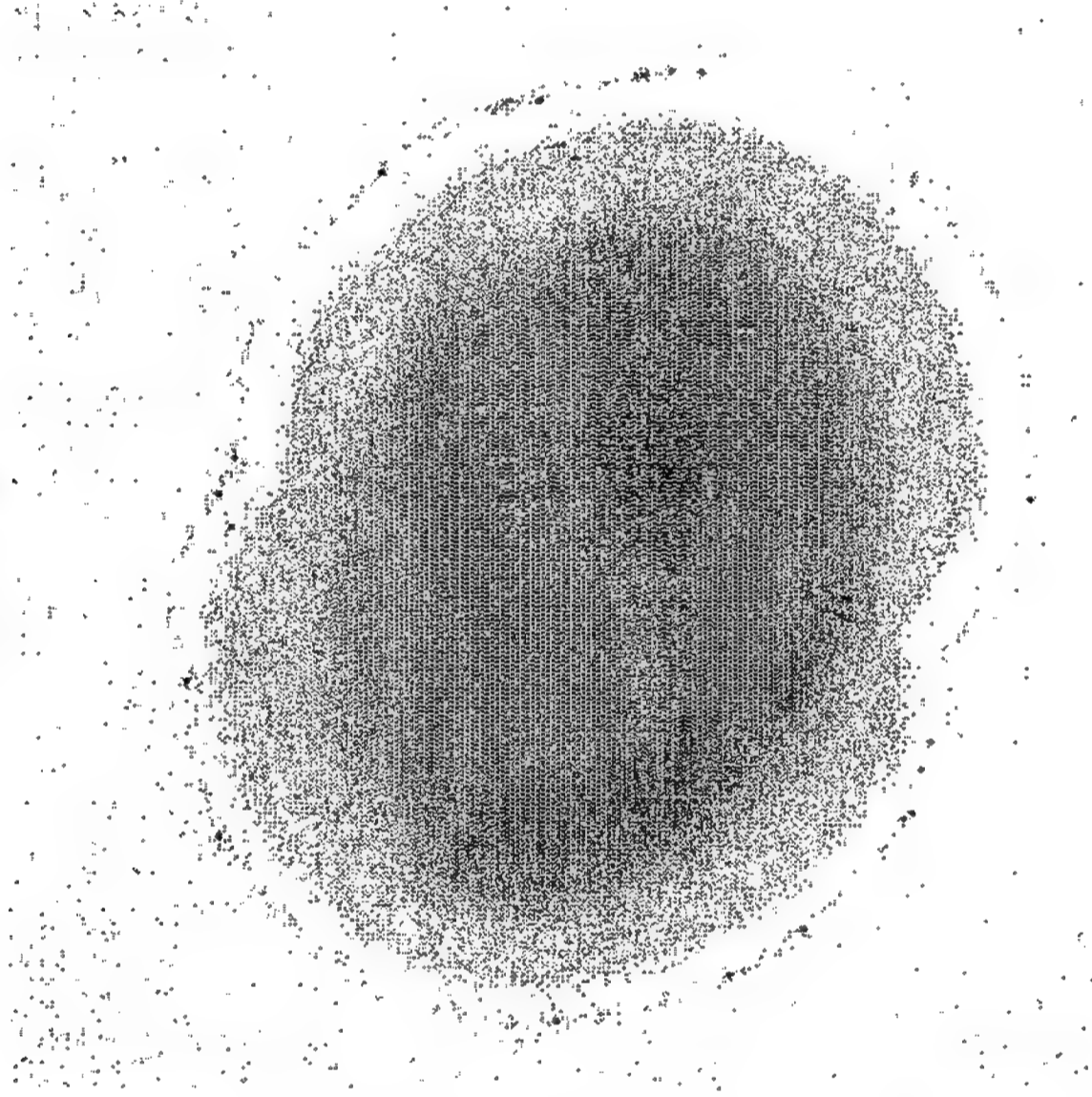
Figure 178

A

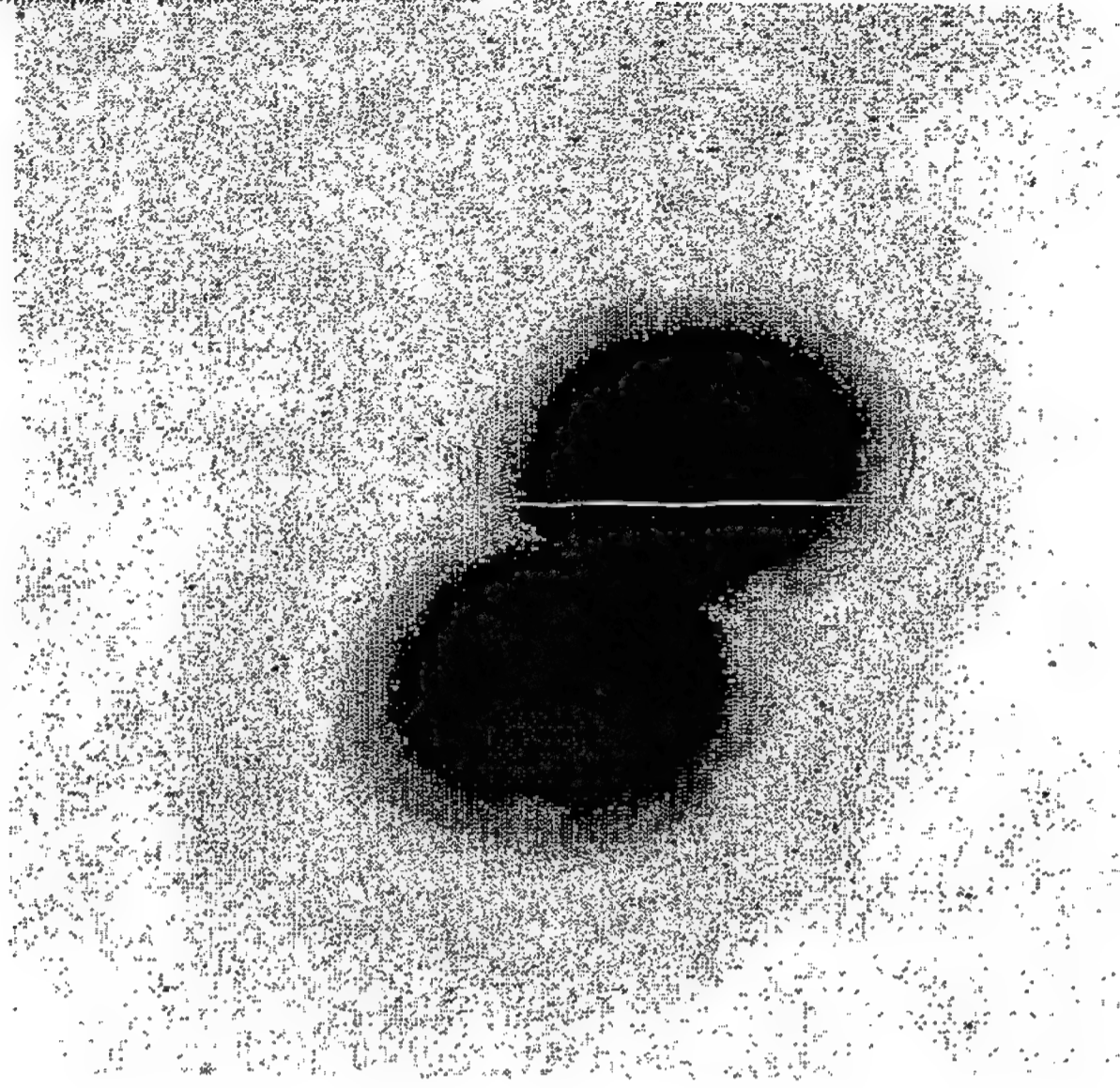
SF370 w.t.



B

 $\Delta 128$ 

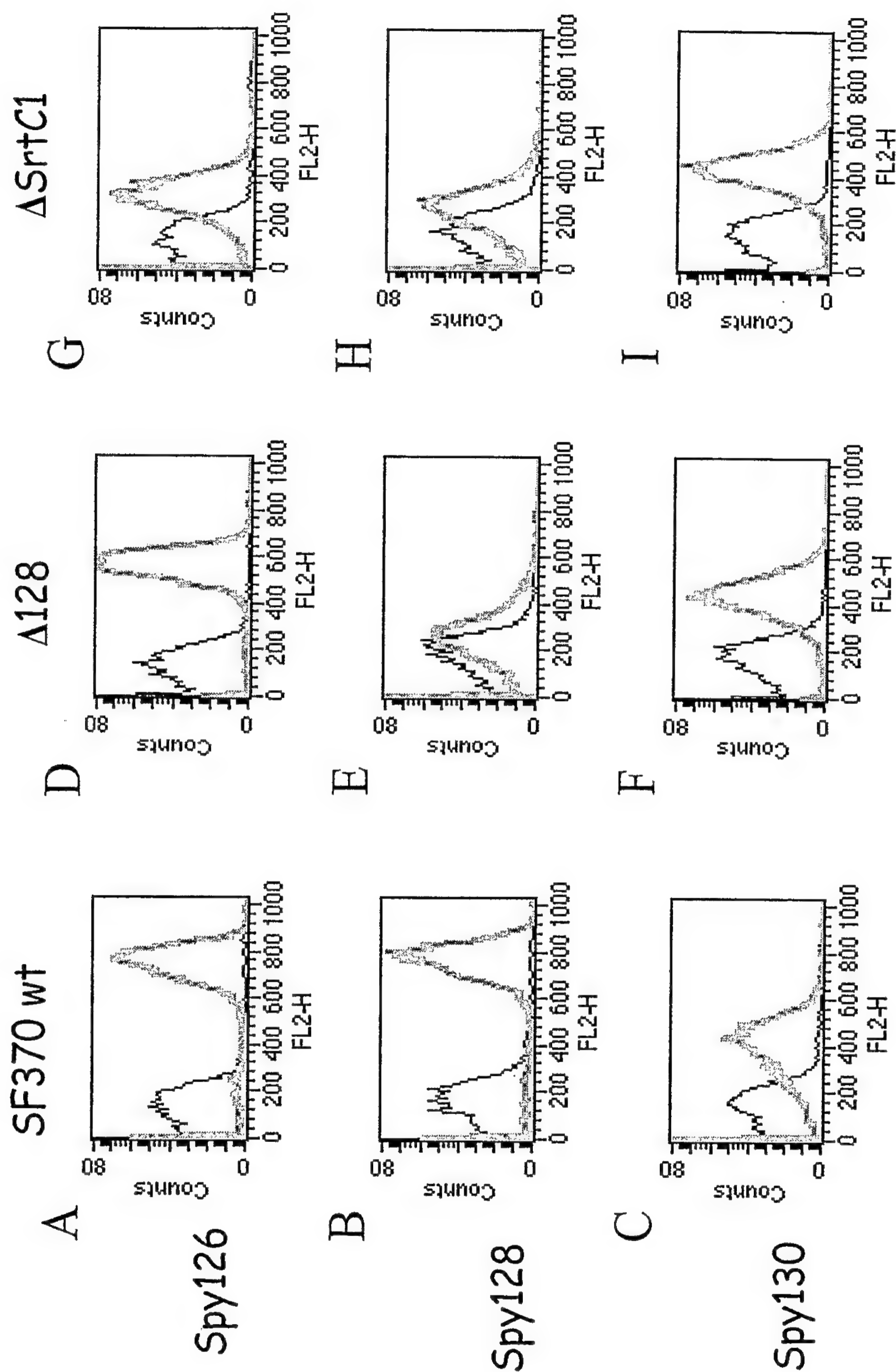
C

 ΔSrtC1 

Immuno-gold labeling with sera against Spy128

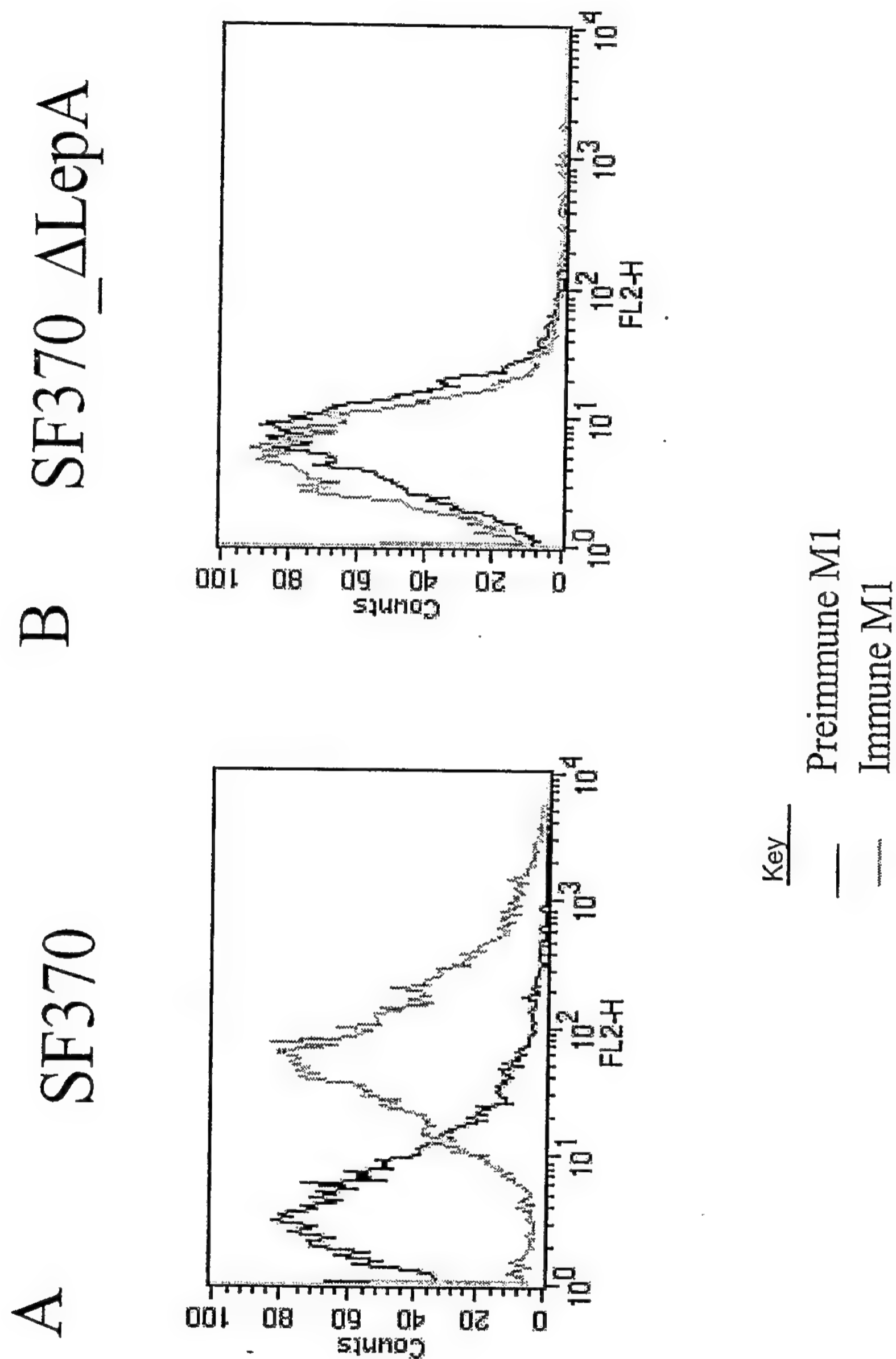
Comparison of wild type and mutant strain by Immunoelectron Microscopy show that Spy128- or SrtC1-lacking bacteria are not able to assemble pili. SrtC1, therefore, is absolutely required for pilus assembly but not for surface anchoring.

Figure 179



PCT/US05/27239 378/487

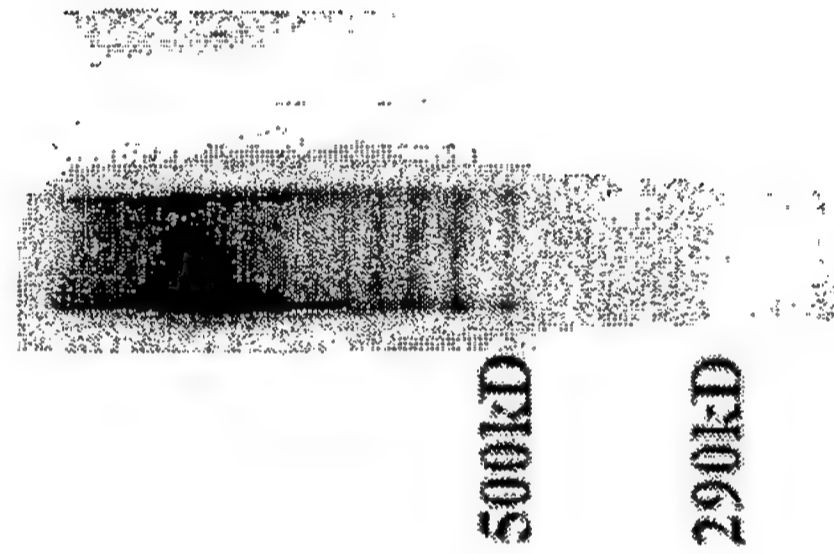
Figure 180



PCT/US05/27239 379/487

Figure 181

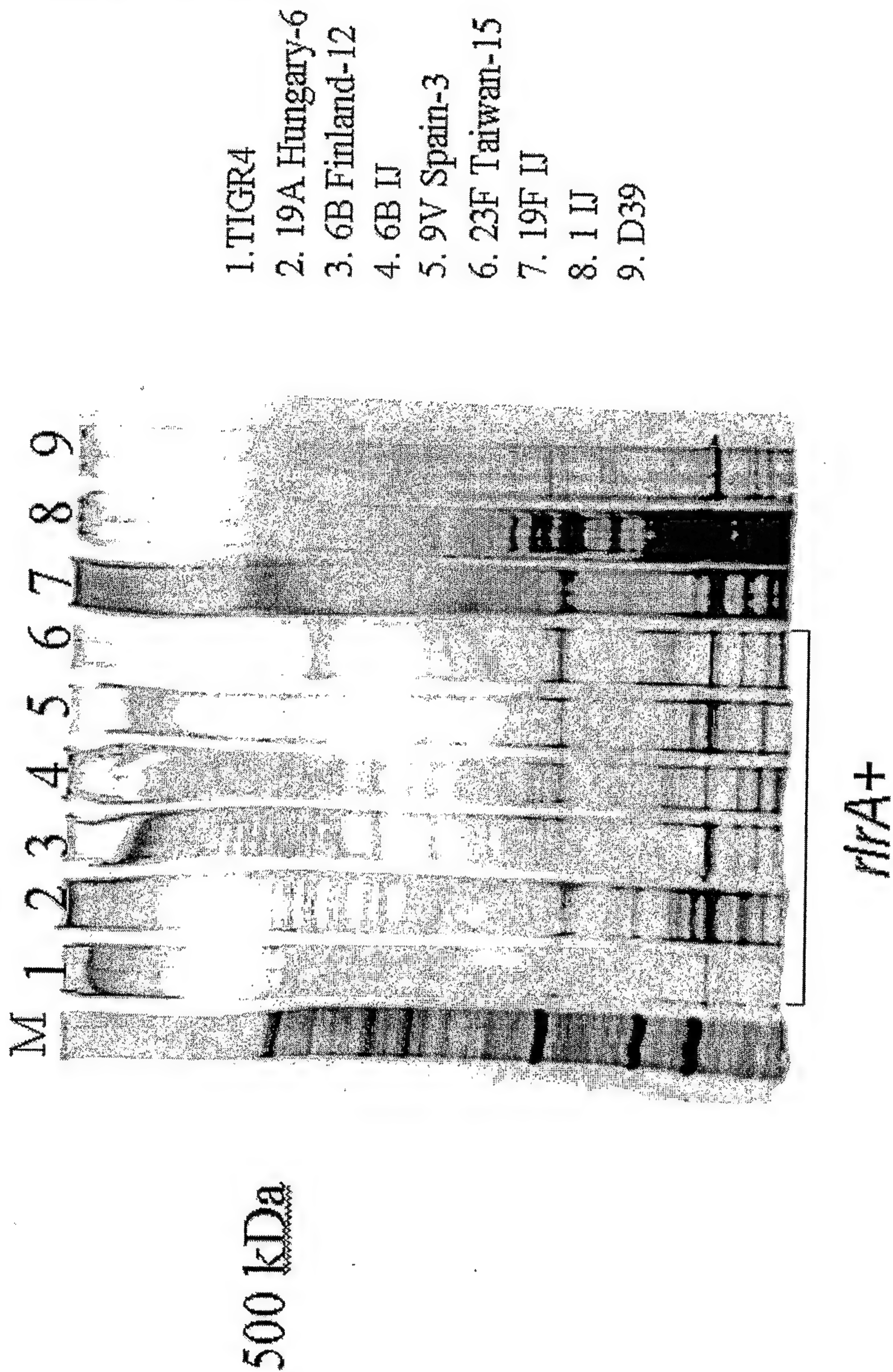
T4
T4A(ttgA-si)

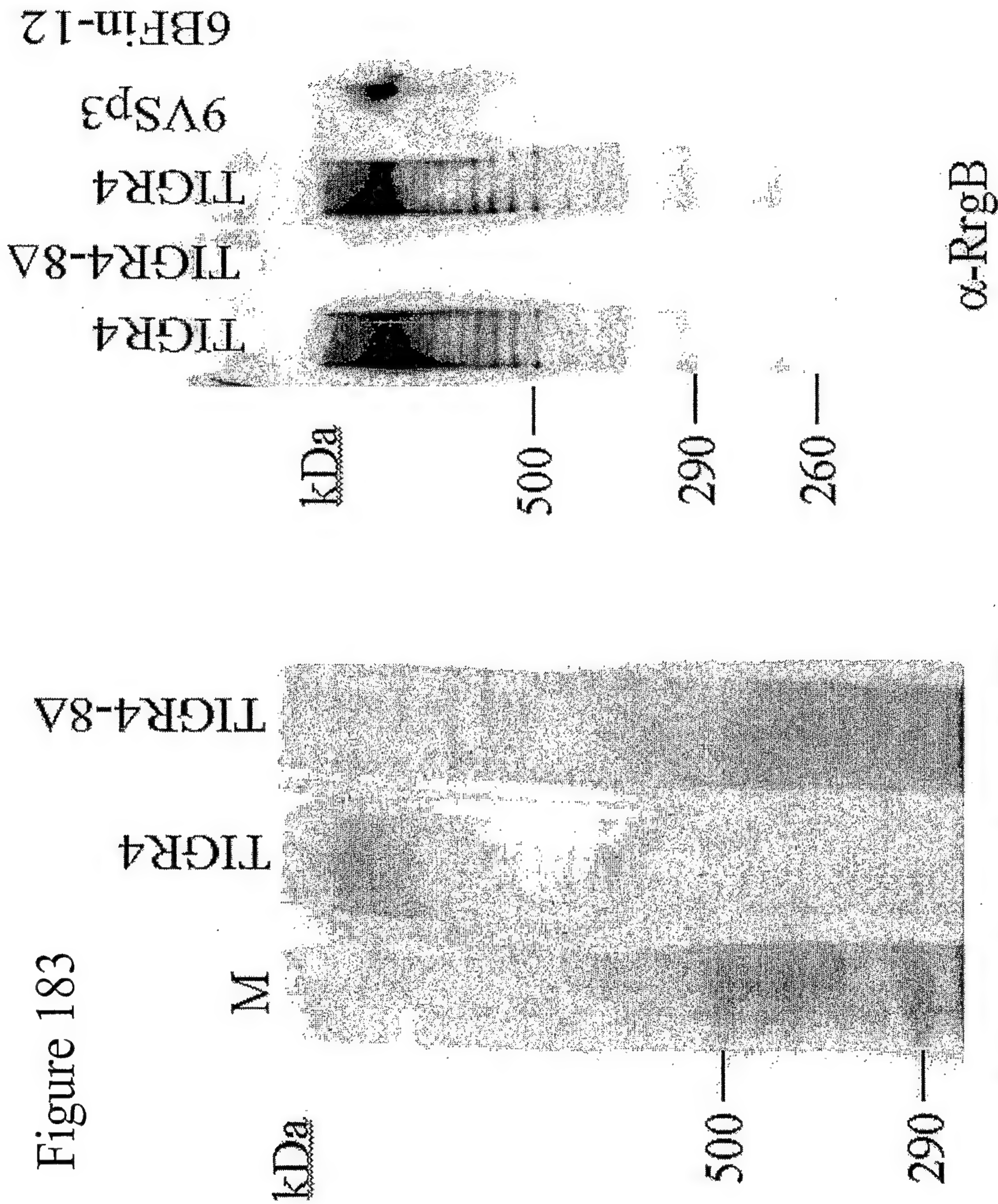


Pili form high molecular weight
polymers in gradient SDS-PAGE gels

α -RrgB

Figure 182





Silver stained gel 3-8%

α -RrgB

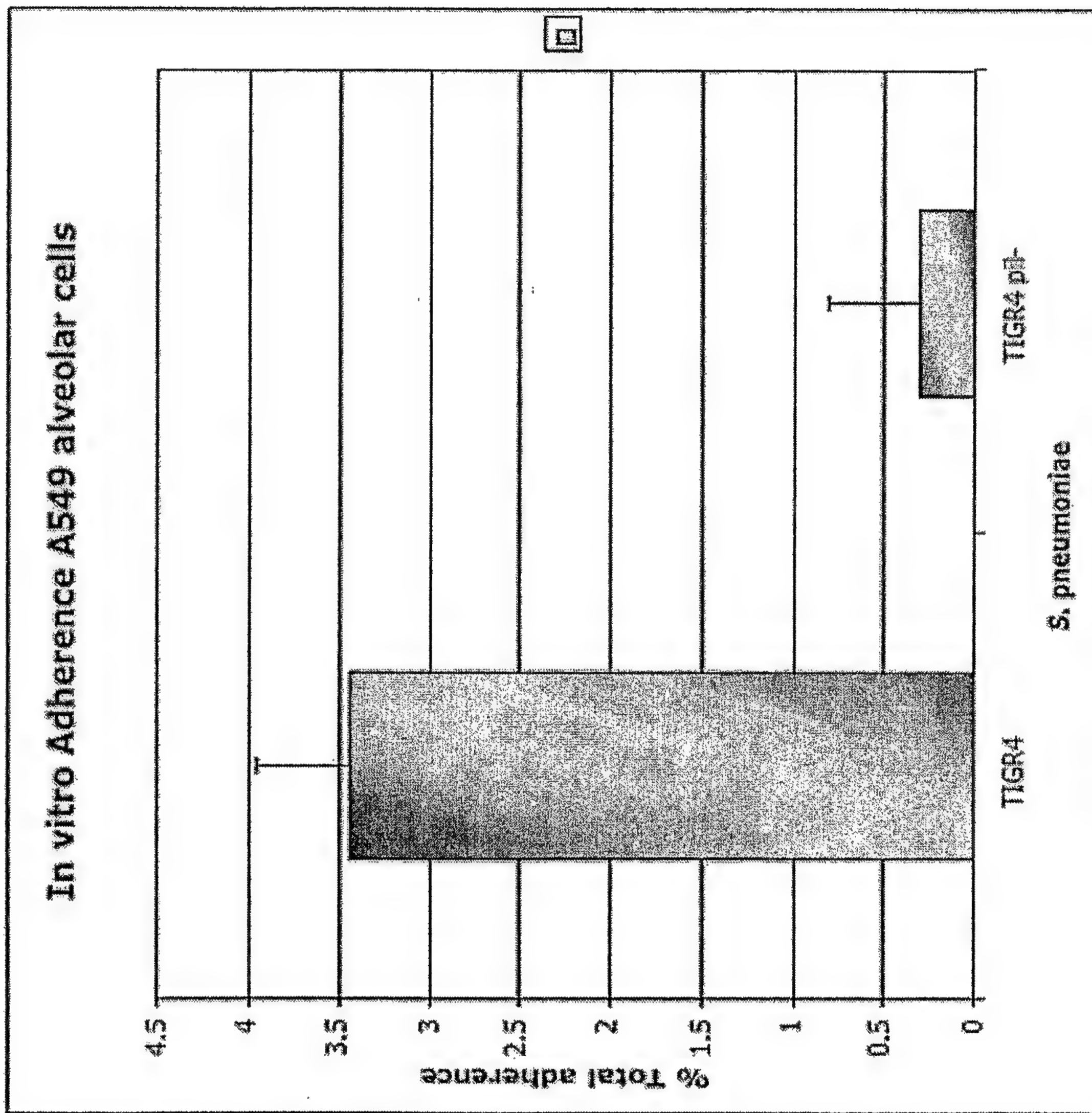
Anti-RrgB TIGR4 recognized the 9v pili

Figure 183

PCT/US05/27239

382/487

Figure 184



PCT/US05/27239 383/487

Figure 185



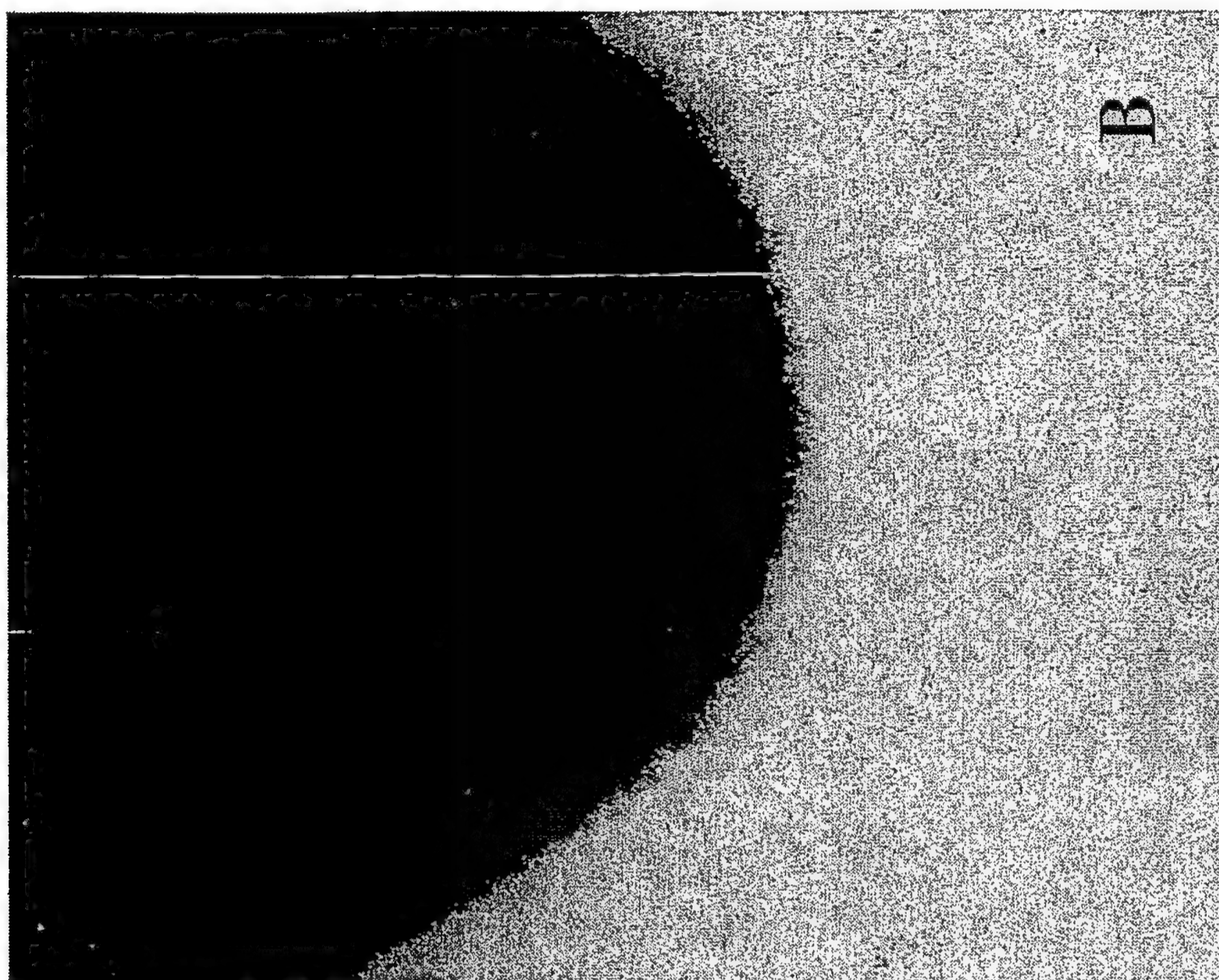


Figure 186

PCT/US05/27239

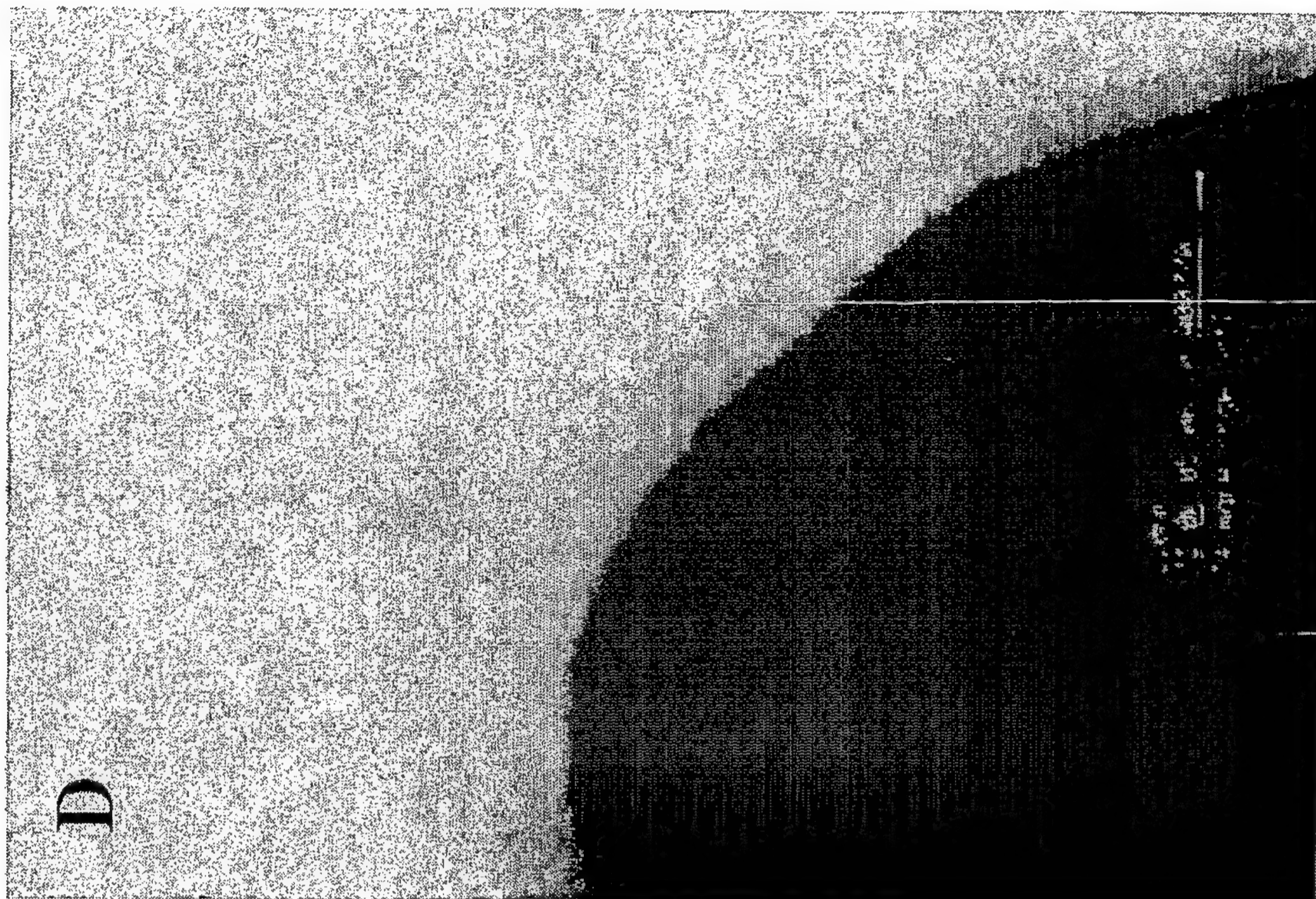


Figure 188

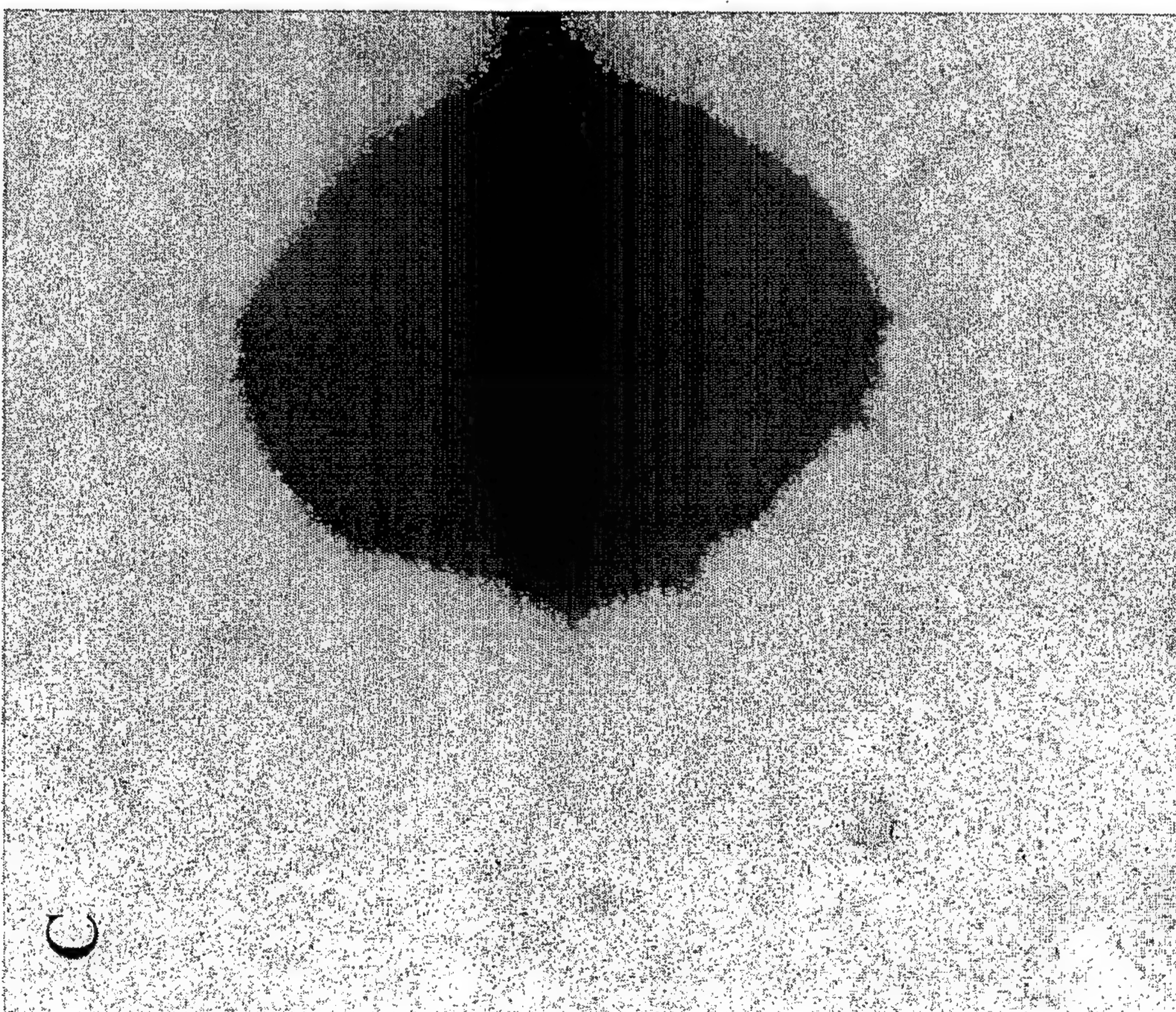


Figure 187

PCT/US05/27239 386/487

Figure 189

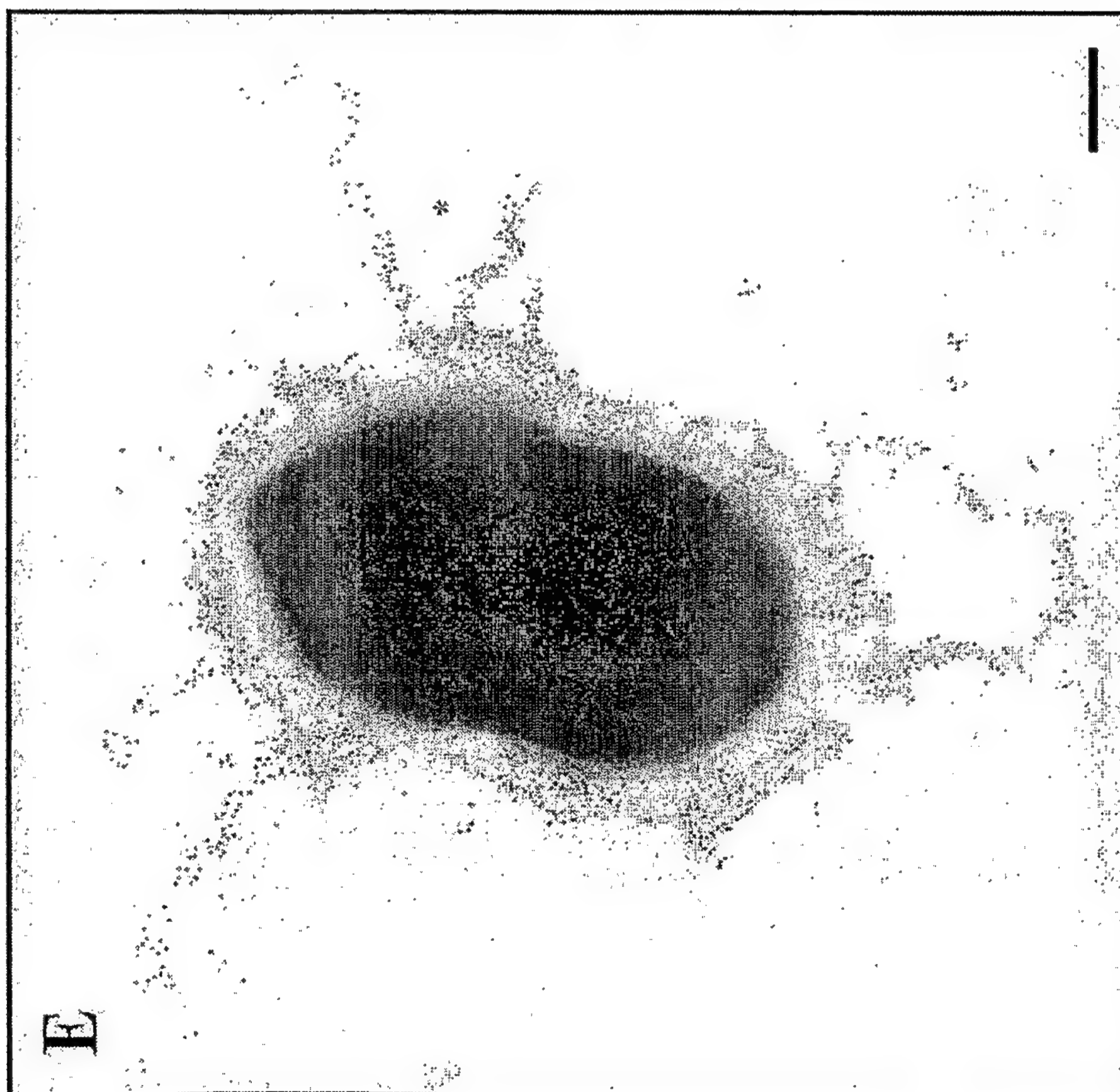


Figure 190

S. pneumoniae pili proteins: sp0462 (Rrg.A)

Expression and purification:

- pET 21b+-*rrg.A-6*

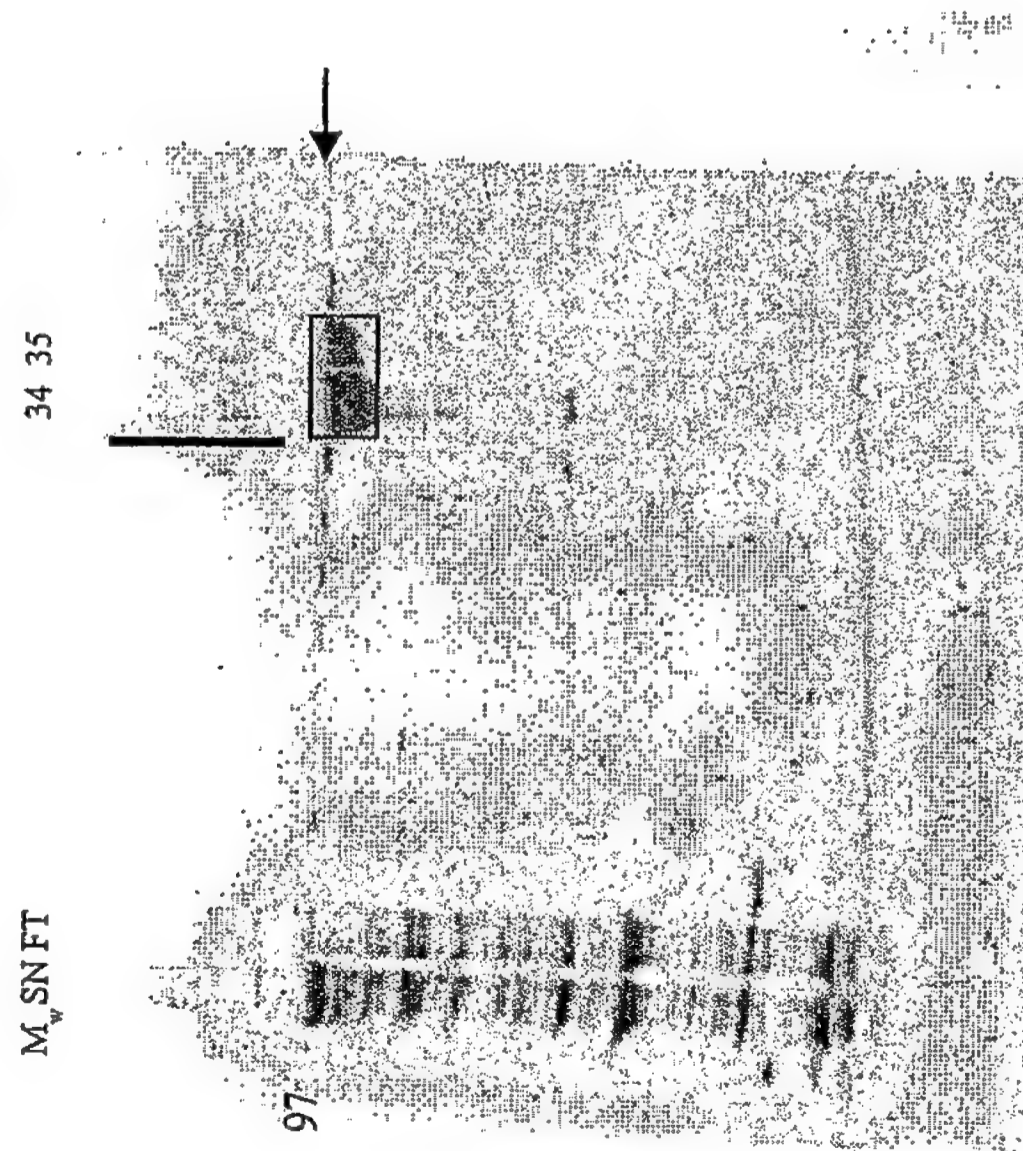
- purified in soluble form (stored at -80°C ; in $\text{NaCl}_{\text{physiol.}}$)



Results:

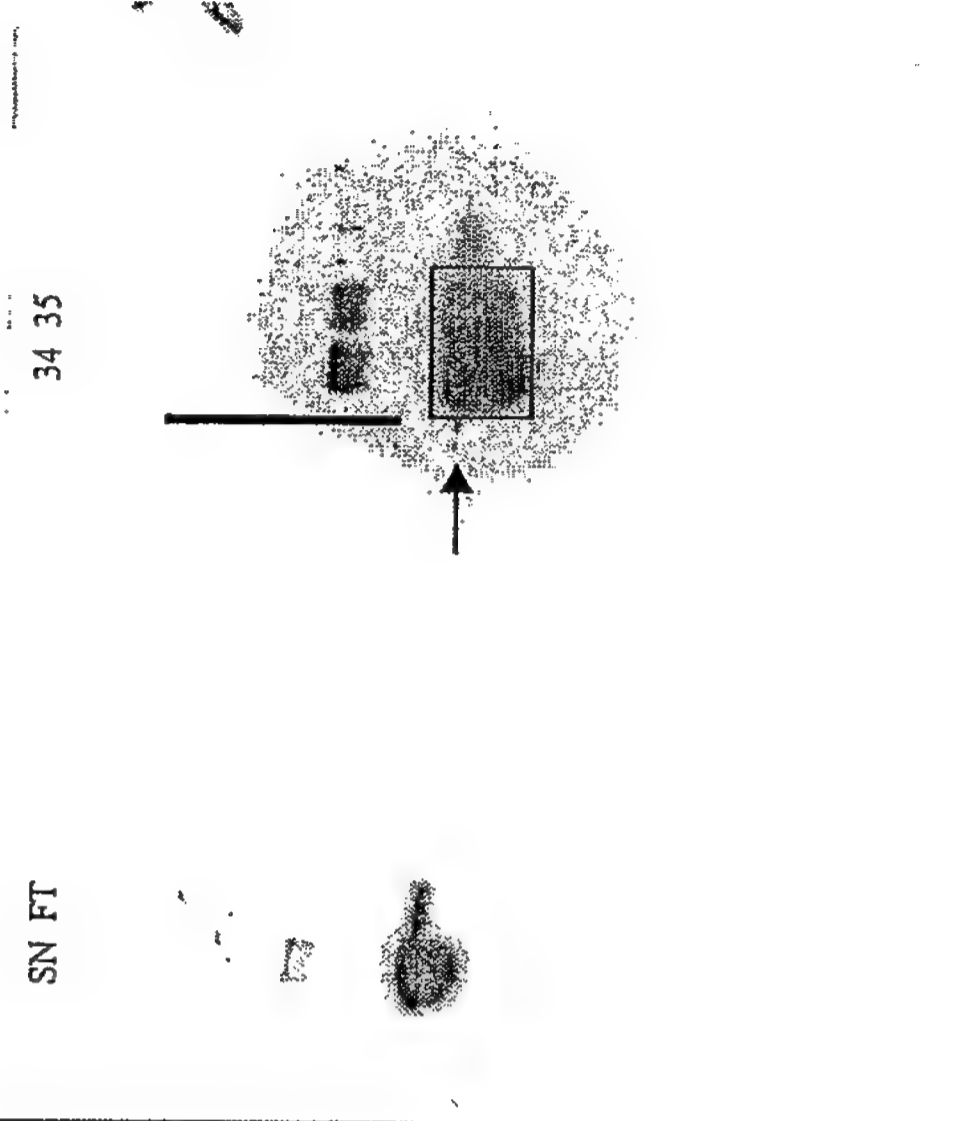
- protein conc.: 1,1 mg/ml

A



SDS-page

B



Western blot (anti-HIS)

S. pneumoniae pili proteins – antibody production (mice)

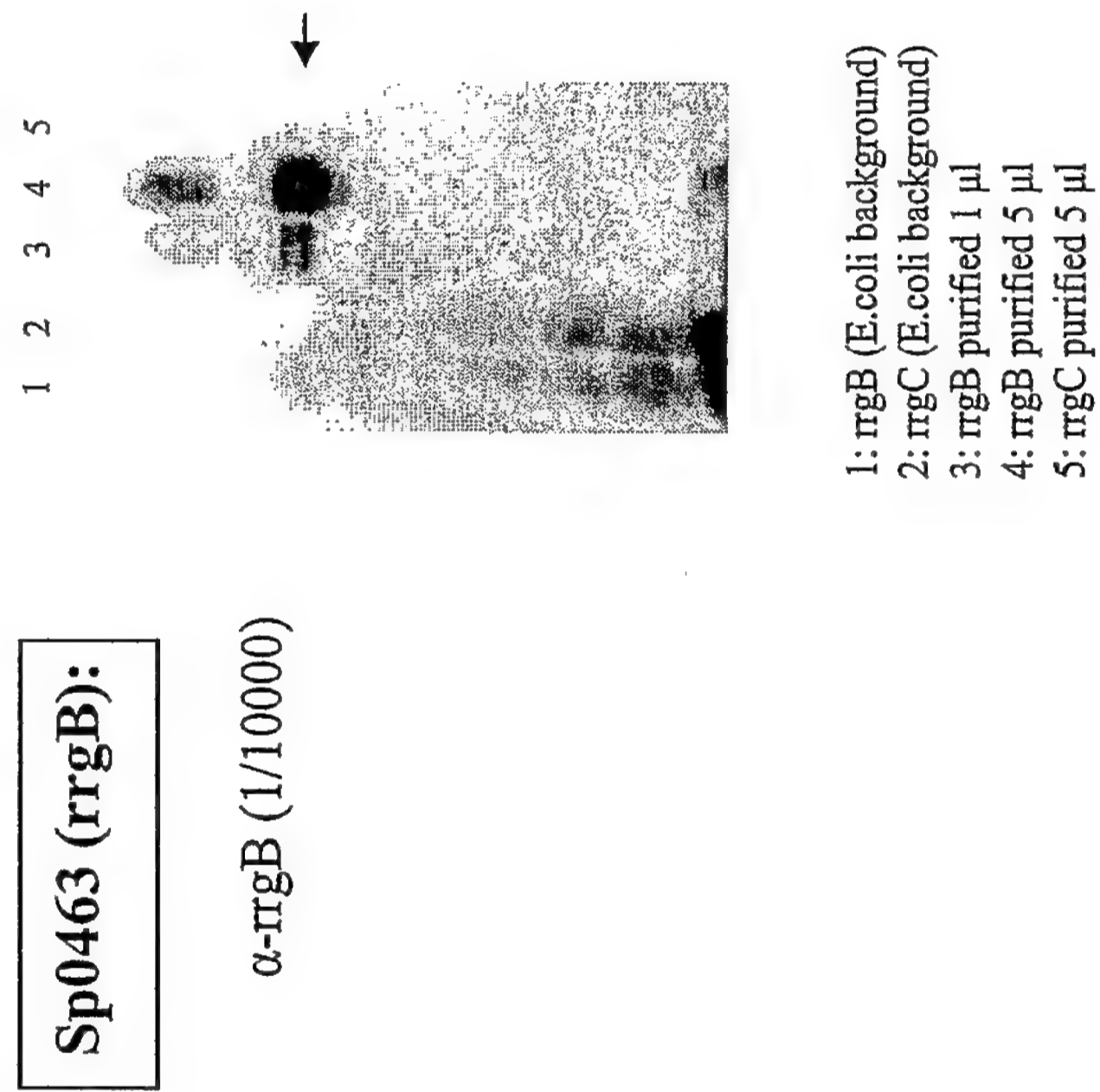


Figure 191

S. pneumoniae pili proteins – antibody production (mice)

PCT/US05/27239 389/487

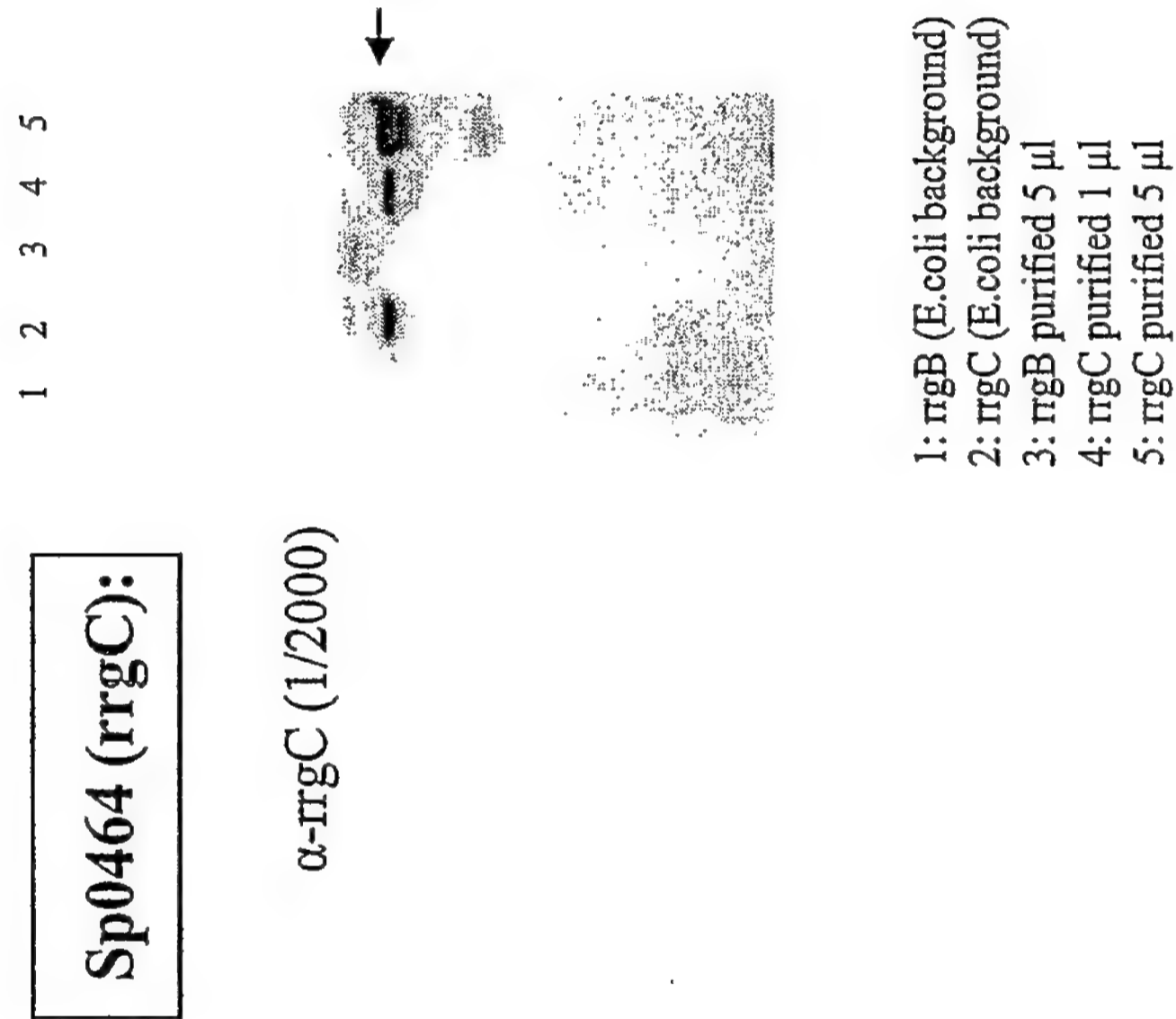
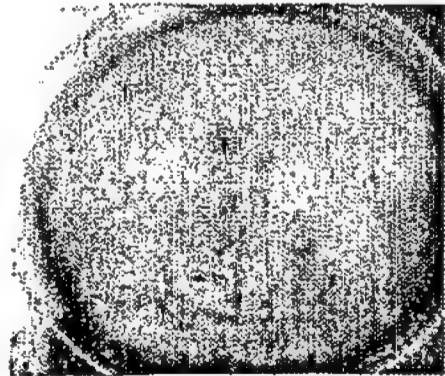


Figure 192

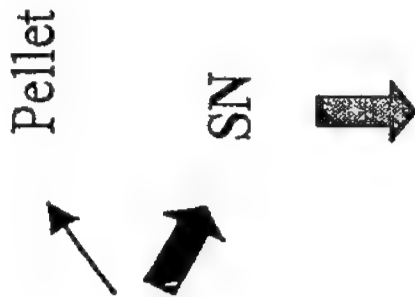
S. pneumoniae TIGR4 pilus purification I – cultivation + digestion



S. pneumoniae TIGR4
Blood plates
ON/37°C/13h

- Resuspension in PBS/washing
- Resuspension in PPB (4-6 plates/ml)
(20% sucrose, 10mM MgCl₂,
50mM NaPPi pH6.3)

- Digestion with Mutanolysin
(N-Acetyl Muramidase)
37°C, ~10 h



Sucrose Density
gradient centrifugation

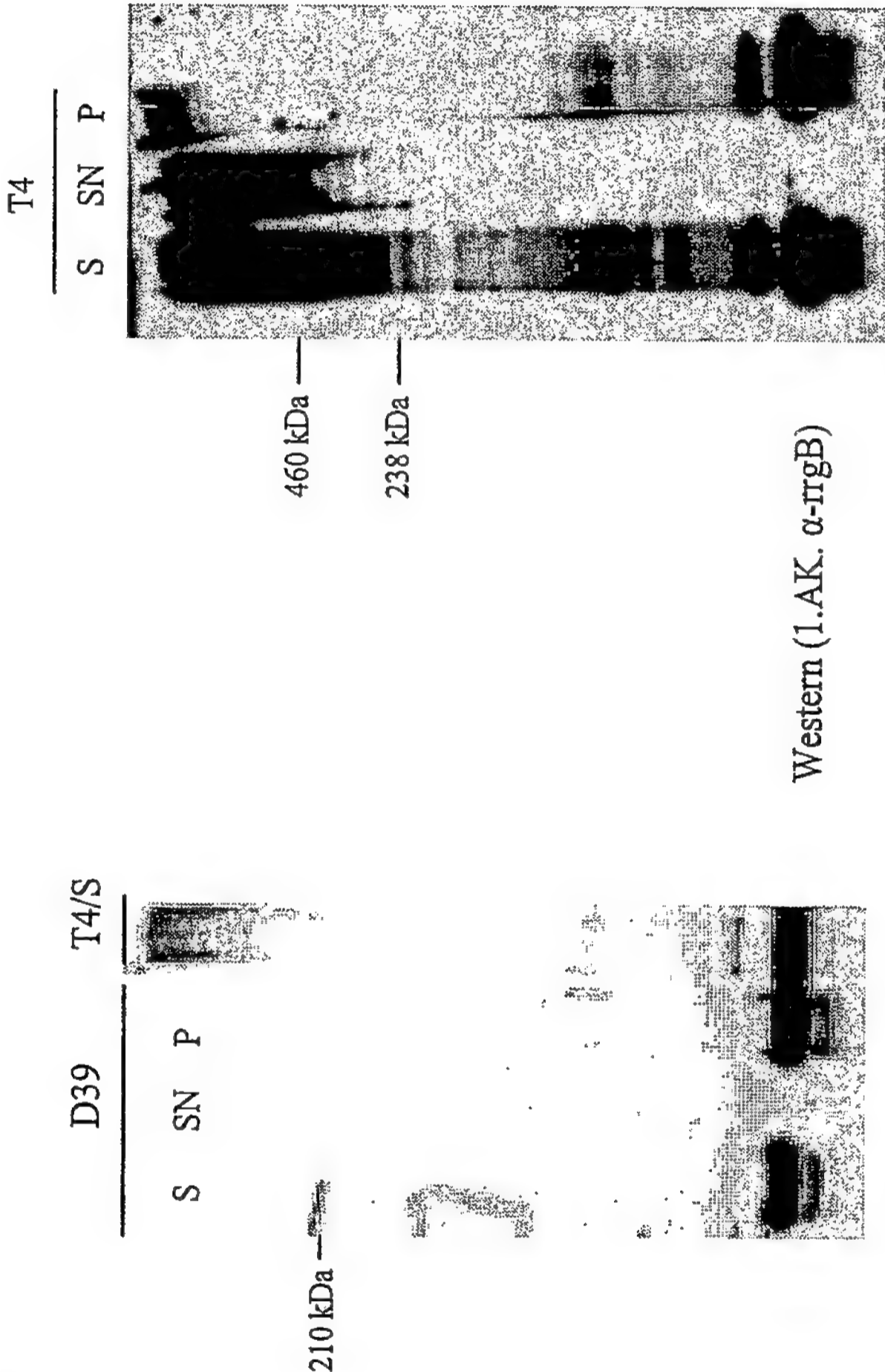


Figure 193

S. pneumoniae TIGR4 pilus purification II - Sucrose density gradient centrifugation

WO 2006/078318

391/487

PCT/US2005/027239

PCT/US2005/027239

950µl SN
25-56% linear sucrose gradient
SW40; 38000, 4°C, 16h



24 x 500 µl fractions
(Gradient master)



Gel filtration

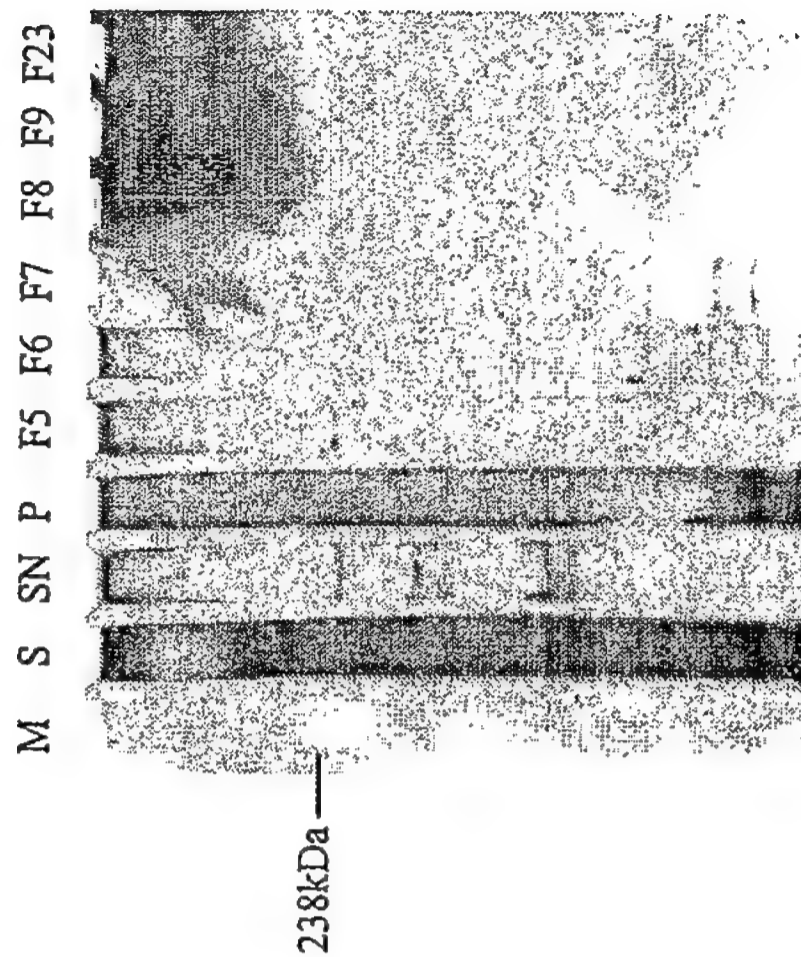
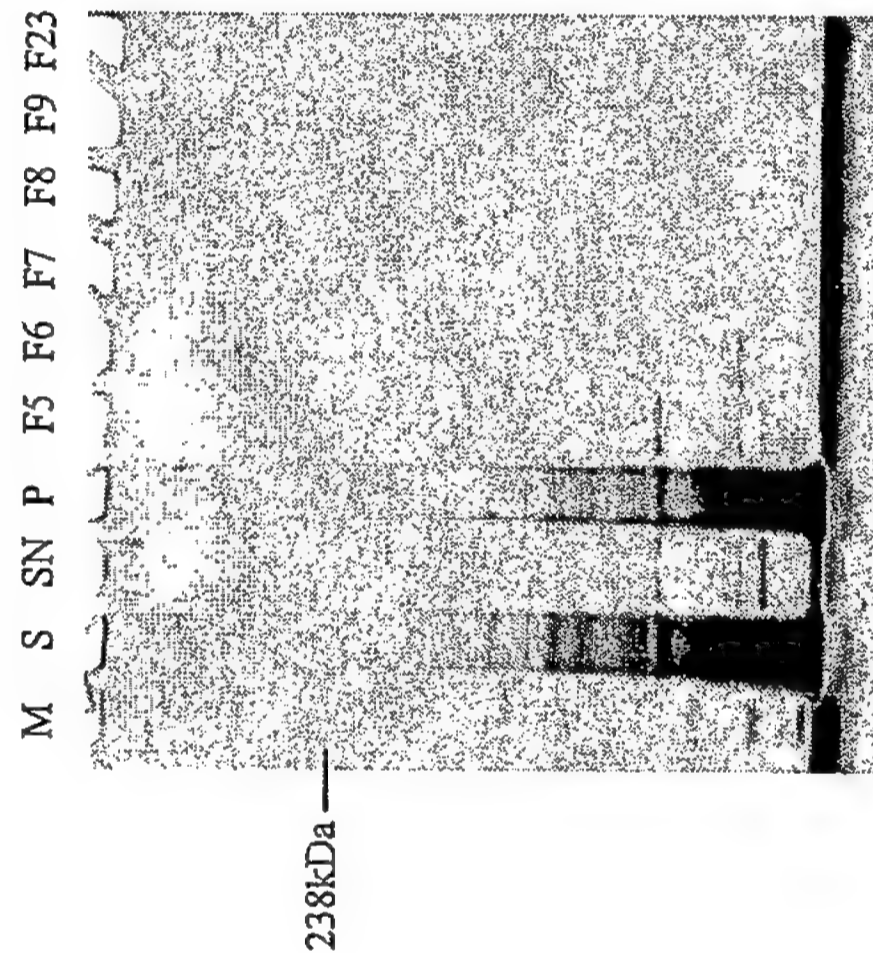
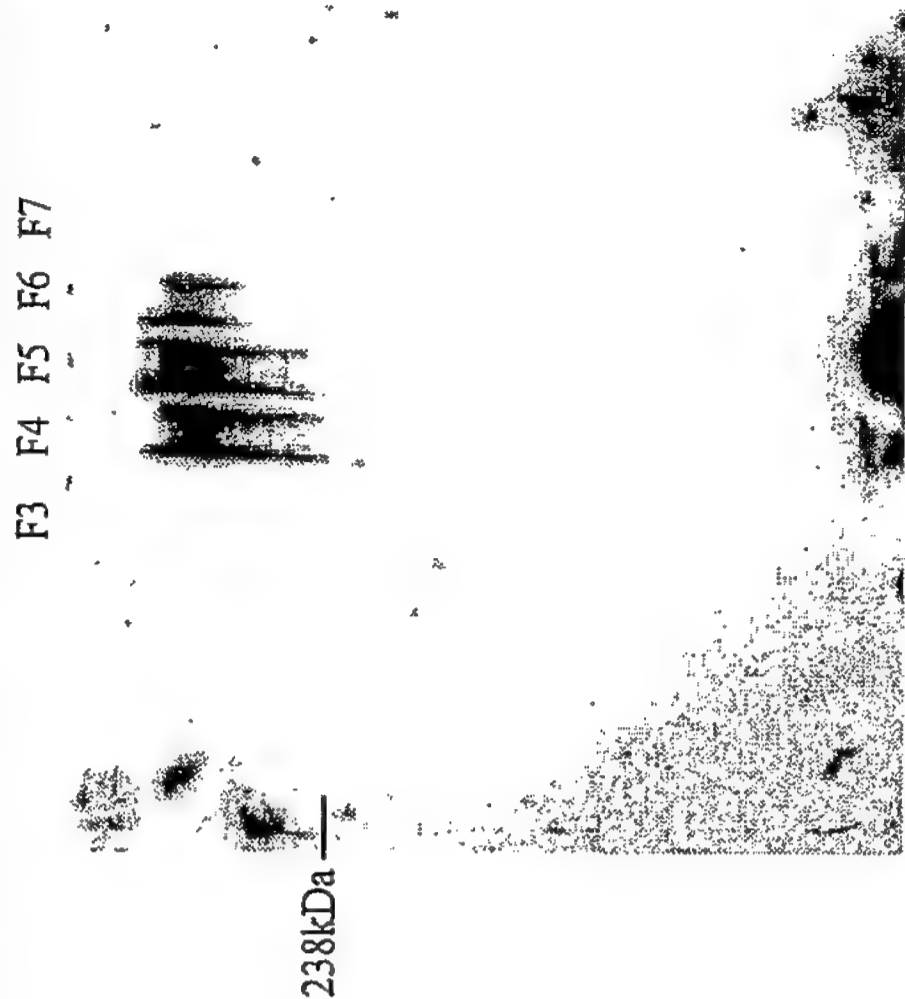
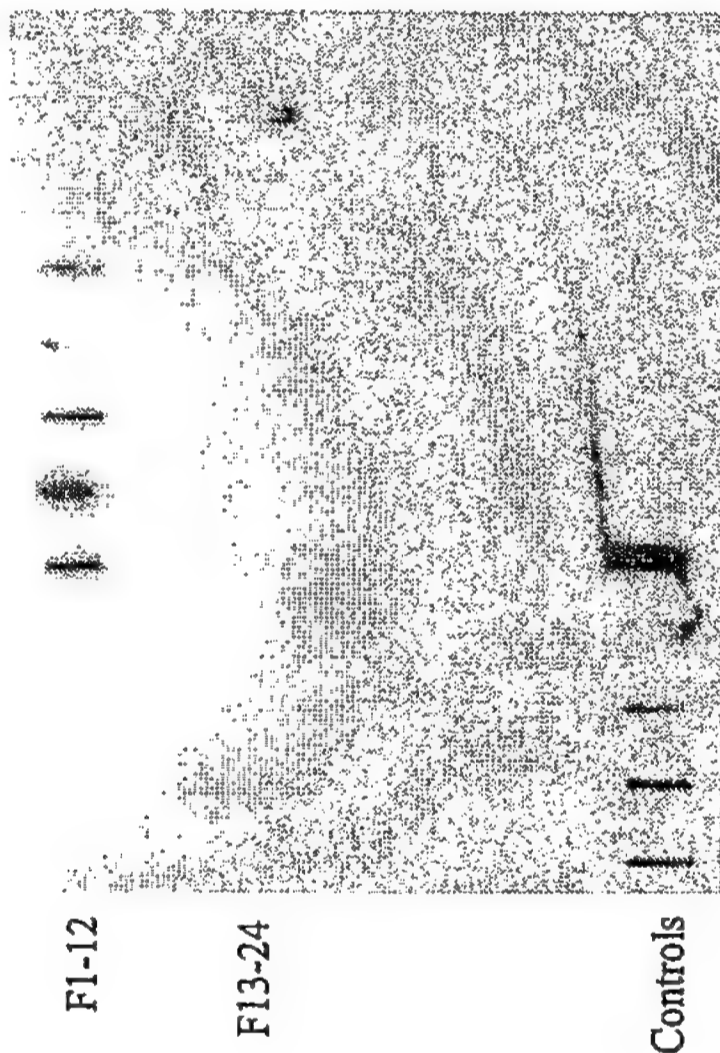
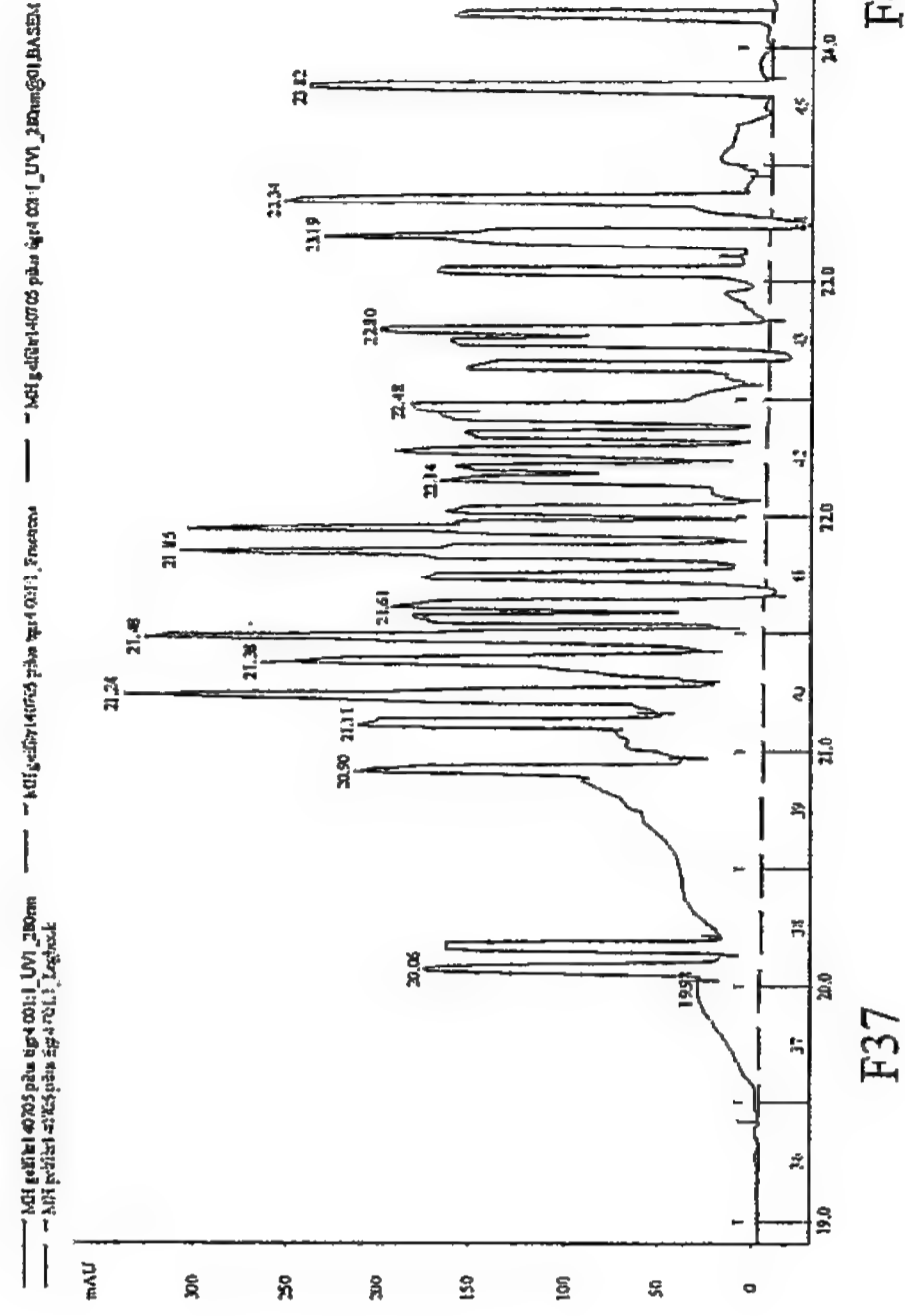
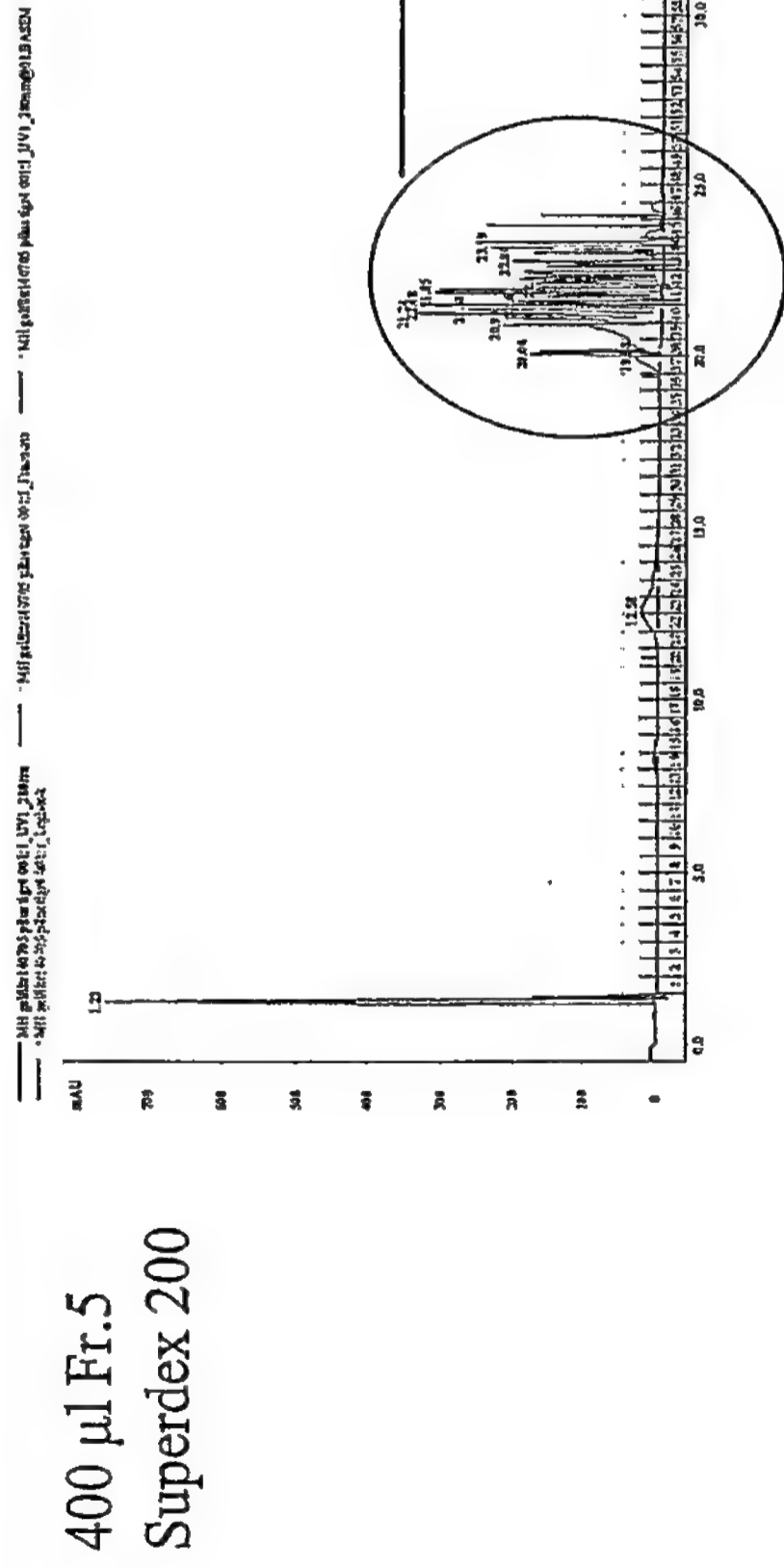


Figure 194

S. pneumoniae TIGR4 pilus purification III – Gel filtration

PCT/US2005/027239



M L 37 38 39 40 41 42 43 44 45 46

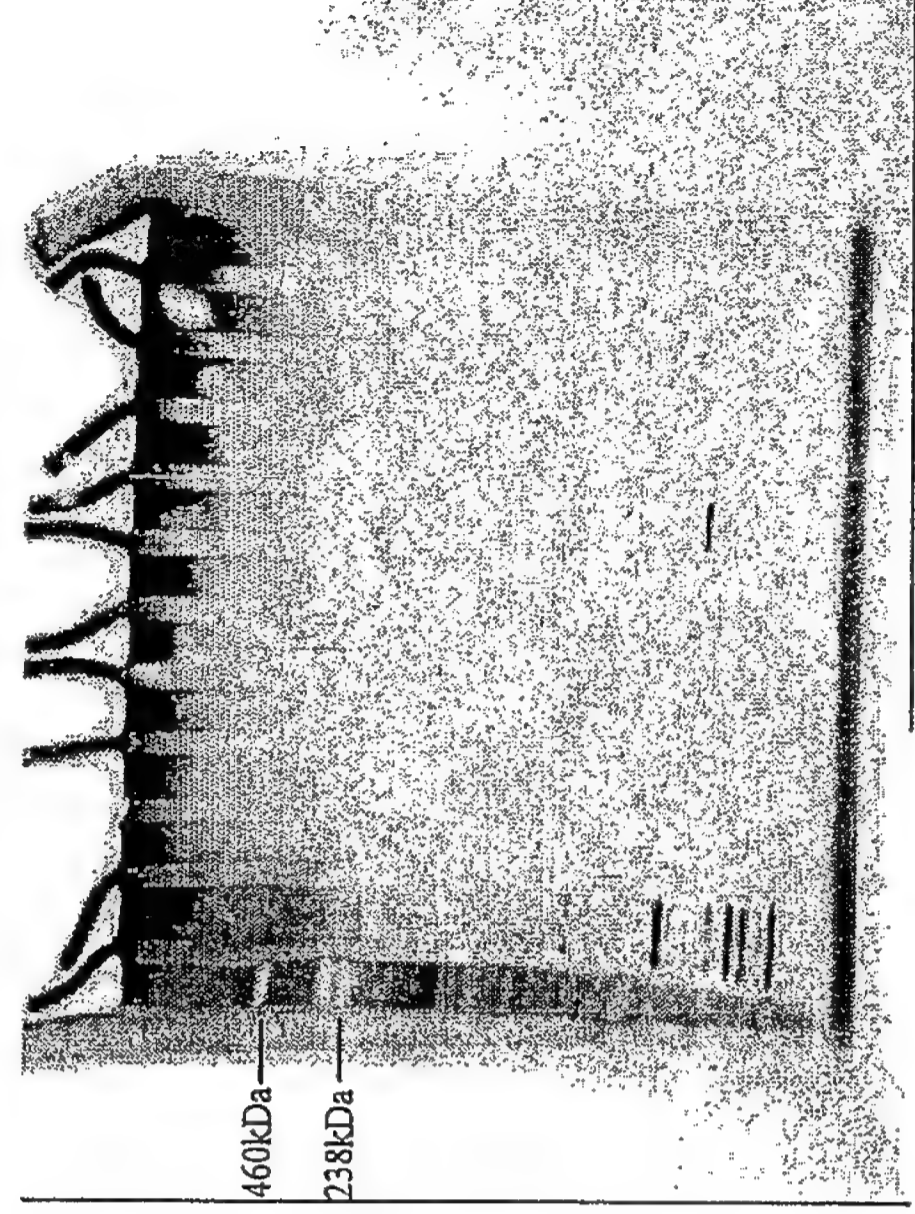


Figure 195

PCT/US05/27239

14CSR -----GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
670 TGAGTTGTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
6BF -----GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
6BSP -----GCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
19AH -----GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
23FPO -----TTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
19FTW -----TTTTCATTATAAATCTTATGGGACTTTTTTGATACTCAAAAAGC
9VSP -----TTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
TIGR4 -----TTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC
23FTW -----GCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC

14CSR CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
670 CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
6BF CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
6BSP CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
19AH CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
23FPO CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
19FTW CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
9VSP CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
TIGR4 CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT
23FTW CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT

14CSR TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC
670 TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC
6BF TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC
6BSP TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC
19AH TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC
23FPO TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC
19FTW TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC
9VSP TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC
TIGR4 TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC
23FTW TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC

14CSR TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
670 TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
6BF TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
6BSP TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
19AH TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
23FPO TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
19FTW TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
9VSP TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
TIGR4 TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG
23FTW TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG

14CSR TACGATGAACCTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
670 TACGATGAACCTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
6BF TACGATGAACCTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
6BSP TACGATGAACCTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
19AH TACGATGAACCTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
23FPO TACGATGAACCTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
19FTW TACGATGAACCTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
9VSP TACGATGAACCTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
TIGR4 TACGATGAACCTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA
23FTW TACGATGAACCTTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA

Figure 196A

394/487

14CSR AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
670 AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
6BF AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
6BSP AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
19AH AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
23FPO AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
19FTW AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
9VSP AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
TIGR4 AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA
23FTW AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA

14CSR AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
670 AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
6BF AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
6BSP AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
19AH AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
23FPO AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
19FTW AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
9VSP AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
TIGR4 AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG
23FTW AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG

14CSR GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
670 GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
6BF GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
6BSP GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
19AH GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
23FPO GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
19FTW GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
9VSP GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
TIGR4 GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG
23FTW GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG

14CSR GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
670 GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
6BF GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
6BSP GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
19AH GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
23FPO GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
19FTW GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
9VSP GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
TIGR4 GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA
23FTW GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA

14CSR AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA
670 AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA
6BF AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA
6BSP AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA
19AH AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA
23FPO AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA
19FTW AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA
9VSP AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA
TIGR4 AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA
23FTW AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA

Figure 196B

395/487

14CSR TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
670 TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
6BF TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
6BSP TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
19AH TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
23FPO TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
19FTW TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
9VSP TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
TIGR4 TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT
23FTW TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT

14CSR GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG
670 GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG
6BF GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG
6BSP GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG
19AH GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG
23FPO GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG
19FTW GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG
9VSP GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG
TIGR4 GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG
23FTW GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG

14CSR AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
670 AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
6BF AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
6BSP AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
19AH AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
23FPO AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
19FTW AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
9VSP AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
TIGR4 AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG
23FTW AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG

14CSR GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
670 GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
6BF GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
6BSP GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
19AH GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
23FPO GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
19FTW GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
9VSP GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
TIGR4 GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA
23FTW GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA

14CSR AAGAAAGAGAATTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT
670 AAGAAAGAGAATTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT
6BF AAGAAAGAGAATTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT
6BSP AAGAAAGAGAATTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT
19AH AAGAAAGAGAATTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT
23FPO AAGAAAGAGAATTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT
19FTW AAGAAAGAGAATTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT
9VSP AAGAAAGAGAATTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT
TIGR4 AAGAAAGAGAATTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT
23FTW AAGAAAGAGAATTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT

Figure 196C

PCT/US05/27239 396/487

14CSR TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
670 TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
6BF TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
6BSP TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
19AH TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
23FPO TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
19FTW TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
9VSP TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
TIGR4 TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT
23FTW TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT

14CSR TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
670 TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
6BF TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
6BSP TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
19AH TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
23FPO TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
19FTW TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
9VSP TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
TIGR4 TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT
23FTW TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT

14CSR CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
670 CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
6BF CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
6BSP CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
19AH CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
23FPO CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
19FTW CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
9VSP CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
TIGR4 CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA
23FTW CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA

14CSR TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
670 TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
6BF TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
6BSP TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
19AH TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
23FPO TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
19FTW TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
9VSP TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
TIGR4 TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG
23FTW TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG

14CSR GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
670 GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
6BF GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
6BSP GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
19AH GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
23FPO GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
19FTW GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
9VSP GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
TIGR4 GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG
23FTW GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG

Figure 196D

PCT/US05/27239 397/487

14CSR GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
670 GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
6BF GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
6BSP GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
19AH GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
23FPO GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
19FTW GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
9VSP GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
TIGR4 GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA
23FTW GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA

14CSR CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA
670 CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA
6BF CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA
6BSP CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA
19AH CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA
23FPO CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA
19FTW CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA
9VSP CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA
TIGR4 CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA
23FTW CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA

14CSR GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
670 GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
6BF GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
6BSP GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
19AH GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
23FPO GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
19FTW GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
9VSP GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTT-CACAAGGTCCA
TIGR4 GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA
23FTW GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA

14CSR AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG
670 AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG
6BF AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG
6BSP AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG
19AH AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG
23FPO AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG
19FTW AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG
9VSP AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG
TIGR4 AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG
23FTW AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG

14CSR AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
670 AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
6BF AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
6BSP AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
19AH AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
23FPO AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
19FTW AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
9VSP AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
TIGR4 AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC
23FTW AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC

Figure 196E

PCT/US05/27239

398/487

14CSR GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
670 GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
6BF GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
6BSP GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
19AH GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
23FPO GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
19FTW GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
9VSP GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
TIGR4 GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT
23FTW GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT

14CSR GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT
670 GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT
6BF GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT
6BSP GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT
19AH GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT
23FPO GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT
19FTW GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT
9VSP GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT
TIGR4 GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT
23FTW GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT

14CSR CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
670 CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
6BF CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
6BSP CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
19AH CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
23FPO CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
19FTW CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
9VSP CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
TIGR4 CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA
23FTW CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA

14CSR AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
670 AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
6BF AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
6BSP AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
19AH AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
23FPO AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
19FTW AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
9VSP AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
TIGR4 AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA
23FTW AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA

14CSR TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
670 TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
6BF TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
6BSP TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
19AH TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
23FPO TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
19FTW TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
9VSP TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
TIGR4 TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC
23FTW TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC

Figure 196F

PCT/US05/27239 399/487

```
14CSR      ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
670        ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
6BF        ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
6BSP       ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
19AH       ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
23FPO      ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
19FTW      ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
9VSP       ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
TIGR4      ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
23FTW      ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
*****

14CSR      TGGAAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
670        TGGAAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
6BF        TGGAAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
6BSP       TGGAAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
19AH       TGGAAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
23FPO      TGGAAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
19FTW      TGGAAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
9VSP       TGGAAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
TIGR4      TGGAAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
23FTW      TGGAAATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
*****

14CSR      TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
670        TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
6BF        TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
6BSP       TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
19AH       TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
23FPO      TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
19FTW      TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
9VSP       TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
TIGR4      TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
23FTW      TGAGTATTGGTGGAGTTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
*****

14CSR      ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
670        ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
6BF        ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
6BSP       ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
19AH       ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
23FPO      ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
19FTW      ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
9VSP       ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
TIGR4      ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
23FTW      ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
*****

14CSR      TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
670        TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
6BF        TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
6BSP       TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
19AH       TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
23FPO      TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
19FTW      TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
9VSP       TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
TIGR4      TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
23FTW      TTTATACTAGGATAGTTAATAGTAATACTATACTA-----TATTGTATACAAGTGTGTCA
*****
```

Figure 196G

PCT/US05/27239 400/487

14CSR TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT
670 TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT
6BF TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT
6BSP TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT
19AH TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT
23FPO TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT
19FTW TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT
9VSP TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT
TIGR4 TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT
23FTW TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT

14CSR GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
670 GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
6BF GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
6BSP GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
19AH GAACGGATTAACCTCAGCATGAGATAAATTTTATCAGAA--TAAGTAATCCGTTTCTTCGT
23FPO GAACGGATTAACCTCAGCATGAGATAAATTTTATCAGAA--TAAGTAATCCGTTTCTTCGT
19FTW GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
9VSP GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
TIGR4 GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT
23FTW GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT

14CSR GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC
670 GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC
6BF GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC
6BSP GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC
19AH GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC
23FPO GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC
19FTW GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC
9VSP GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC
TIGR4 GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC
23FTW GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC

14CSR TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
670 TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
6BF TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
6BSP TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
19AH TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
23FPO TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
19FTW TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
9VSP TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
TIGR4 TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC
23FTW TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC

14CSR TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
670 TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
6BF TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
6BSP TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
19AH TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
23FPO TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
19FTW TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
9VSP TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
TIGR4 TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG
23FTW TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG

Figure 196H

PCT/US2005/027239

14CSR AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
670 AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
6BF AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
6BSP AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
19AH AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
23FPO AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
19FTW AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
9VSP AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
TIGR4 AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC
23FTW AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC

14CSR TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
670 TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
6BF TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
6BSP TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
19AH TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
23FPO TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
19FTW TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
9VSP TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGAATGGCACAACCTGTTTCGCAAAGGA
TIGR4 TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA
23FTW TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA

14CSR CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
670 CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
6BF CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
6BSP CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
19AH CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
23FPO CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
19FTW CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
9VSP CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
TIGR4 CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA
23FTW CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA

14CSR CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
670 CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
6BF CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
6BSP CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
19AH CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
23FPO CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
19FTW CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
9VSP CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAACGGACTGTTGAAGTTG
TIGR4 CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG
23FTW CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG

14CSR AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
670 AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
6BF AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
6BSP AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
19AH AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
23FPO AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
19FTW AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
9VSP AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
TIGR4 AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT
23FTW AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT

Figure 196I

PCT/US05/27239

```
14CSR      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
670        CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
6BF        CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
6BSP       CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
19AH       CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
23FPO      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
19FTW      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
9VSP       CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
TIGR4      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
23FTW      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
*****

14CSR      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
670        AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
6BF        AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
6BSP       AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
19AH       AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
23FPO      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
19FTW      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
9VSP       AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
TIGR4      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
23FTW      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
*****

14CSR      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
670        GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
6BF        GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
6BSP       GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
19AH       GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
23FPO      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
19FTW      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
9VSP       GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
TIGR4      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
23FTW      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
*****

14CSR      ACCAATATGGAATCGAGTTGACGGTTAGTGTTAAACGACGGTTGAAACGAAAGAAGCCT
670        ACCAATATGGAATCGAGTTGACGGTTAGTGTTAAACGACGGTTGAAACGAAAGAAGCCT
6BF        ACCAATATGGAATCGAGTTGACGGTTAGTGTTAAACGACGGTTGAAACGAAAGAAGCCT
6BSP       ACCAATATGGAATCGAGTTGACGGTTAGTGTTAAACGACGGTTGAAACGAAAGAAGCCT
19AH       ACCAATATGGAATCGAGTTGACGGTTAGTGTTAAACGACGGTTGAAACGAAAGAAGCCT
23FPO      ACCAATATGGAATCGAGTTGACGGTTAGTGTTAAACGACGGTTGAAACGAAAGAAGCCT
19FTW      ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
9VSP       ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
TIGR4      ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
23FTW      ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
*****

14CSR      CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
670        CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
6BF        CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
6BSP       CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
19AH       CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
23FPO      CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
19FTW      CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTCGAA
9VSP       CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTCGAA
TIGR4      CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTCGAA
23FTW      CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTCGAA
**      *****
```

Figure 196J

14CSR	ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
670	ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
6BF	ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
6BSP	ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
19AH	ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
23FPO	ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
19FTW	ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCGACACGTTCTCTTATTGATAAAA
9VSP	ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCGACACGTTCTCTTATTGATAAAA
TIGR4	ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCGACACGTTCTCTTATTGATAAAA
23FTW	ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCGACACGTTCTCTTATTGATAAAA
	* ** **** * ** ***** ** * * * ***** * *** * ***** *
14CSR	TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
670	TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
6BF	TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
6BSP	TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
19AH	TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
23FPO	TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
19FTW	TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCTTTGATG
9VSP	TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCTTTGATG
TIGR4	TTACATCTGATTCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCTTTGATG
23FTW	TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCTTTGATG
	**** * ** **** * * ***** ***** ***** * ***** *
14CSR	G TTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
670	G TTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
6BF	G TTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
6BSP	G TTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
19AH	G TTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
23FPO	G TTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
19FTW	GGACCGAGTTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGAAAACGATTGAATGATT
9VSP	GGACCGAGTTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGAAAACGATTGAATGATT
TIGR4	GGACCGAGTTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGAAAGCGATTGAATGATT
23FTW	GGACCGAGTTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGAAAACGATTGAATGATT
	* * ** *** * ***** ***** ***** ***** *
14CSR	CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
670	CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
6BF	CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
6BSP	CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
19AH	CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
23FPO	CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
19FTW	CTCTTTTTTTGGAATTATGATCAGACGAGTTTTTACAACCAATACCAAAGATTATAGTTATT
9VSP	CTCTTTTTTTGGAATTATGATCAGACGAGTTTTTACAACCAATACCAAAGATTATAGTTATT
TIGR4	CTCTTTTTTTGGAATTATGATCAGACGAGTTTTTACAACCAATACCAAAGATTATAGTTATT
23FTW	CTCTTTTTTTGGAATTATGATCAGACGAGTTTTTACAACCAATACCAAAGATTATAGTTATT
	* *** **** * ***** ***** ***** * * * * ***** * **
14CSR	TAAATCTCACATCAGATCCTACTGATATTCAAACCTATTAAGGATAGGATTCCATCAGATG
670	TAAATCTCACATCAGATCCTACTGATATTCAAACCTATTAAGGATAGGATTCCATCAGATG
6BF	TAAATCTCACATCAGATCCTACTGATATTCAAACCTATTAAGGATAGGATTCCATCAGATG
6BSP	TAAATCTCACATCAGATCCTACTGATATTCAAACCTATTAAGGATAGGATTCCATCAGATG
19AH	TAAATCTCACATCAGATCCTACTGATATTCAAACCTATTAAGGATAGGATTCCATCAGATG
23FPO	TAAATCTCACATCAGATCCTACTGATATTCAAACCTATTAAGGATAGGATTCCATCAGATG
19FTW	TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAAATAAGGTACCTACCGAGG
9VSP	TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAAATAAGGTACCTACCGAGG
TIGR4	TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAAATAAGGTACCTACCGAGG
23FTW	TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAAATAAGGTACCTACCGAGG
	***** * * * ***** *

PCT/US05/27239

404/487

14CSR CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
670 CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
6BF CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
6BSP CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
19AH CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
23FPO CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG
19FTW CAGAAGATCATGATGGAAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG
9VSP CAGAAGACCATGATGGAAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG
TIGR4 CAGAAGACCATGATGGAAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG
23FTW CAGAAGACCATGATGGAAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG
***** ** * * * ***** ** ***** * * * * *

14CSR CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
670 CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
6BF CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
6BSP CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
19AH CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
23FPO CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA
19FTW CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA
9VSP CTTTGATGAAGGCCGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA
TIGR4 CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA
23FTW CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA
***** ** ***** ** ***** * * * * * ***** ** * * *

14CSR TTTTCCACATTACAGATGGTGTTCGCGACTATGTCATATCCAATTAATTTTAAATATACAG
670 TTTTCCACATTACAGATGGTGTTCGCGACTATGTCATATCCAATTAATTTTAAATATACAG
6BF TTTTCCACATTACAGATGGTGTTCGCGACTATGTCATATCCAATTAATTTTAAATATACAG
6BSP TTTTCCACATTACAGATGGTGTTCGCGACTATGTCATATCCAATTAATTTTAAATATACAG
19AH TTTTCCACATTACAGATGGTGTTCGCGACTATGTCATATCCAATTAATTTTAAATATACAG
23FPO TTTTCCACATTACAGATGGTGTTCGCGACTATGTCATATCCAATTAATTTTAAATATACAG
19FTW TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA
9VSP TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA
TIGR4 TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA
23FTW TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA
***** ***** ***** ** ***** ***** ***** ***** ** *

14CSR GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT
670 GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT
6BF GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT
6BSP GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT
19AH GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT
23FPO GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT
19FTW CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTTAGTAAAT-CTCCTAATAAA
9VSP CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTTAGTAAAT-CTCCTAATAAA
TIGR4 CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTTAGTAAAT-CTCCTAATAAA
23FTW CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTTAGTAAAT-CTCCTAATAAA
* *

14CSR AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
670 AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
6BF AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
6BSP AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
19AH AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
23FPO AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT
19FTW GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA
9VSP GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA
TIGR4 GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA
23FTW GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA
* *

Figure 196L

14CSR	CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
670	CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
6BF	CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
6BSP	CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
19AH	CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
23FPO	CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
19FTW	CGCGGAGATGGGCAAAGTTACCAGATGTTTACAGATAAGACAGTTTATGAAAAAGGTGCT
9VSP	CGCGGAGATGGGCAAAGTTACCAGATGTTTACAGATAAGACAGTTTATGAAAAAGGTGCT
TIGR4	CGCGGAGATGGGCAAAGTTACCAGATGTTTACAGATAAGACAGTTTATGAAAAAGGTGCT
23FTW	CGCGGAGATGGGCAAAGTTACCAGATGTTTACAGATAAGACAGTTTATGAAAAAGGTGCT
	** *****
14CSR	TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
670	TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
6BF	TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
6BSP	TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
19AH	TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
23FPO	TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
19FTW	CCTGCAGCTTTCCAGTTAAACCTGAAAAATATTCTGAAATGAAGGCGGTTGGTTATGCA
9VSP	CCTGCAGCTTTCCAGTTAAACCTGAAAAATATTCTGAAATGAAGGCGGTTGGTTATGCA
TIGR4	CCTGCAGCTTTCCAGTTAAACCTGAAAAATATTCTGAAATGAAGGCGGCTGGTTATGCA
23FTW	CCTGCAGCTTTCCAGTTAAACCTGAAAAATATTCTGAAATGAAGGCGGCTGGTTATGCA
	* ** * * * * *
14CSR	TCAGCGGGATATAGGTTCTATGGAAGTACTTGTATTTATATTGGCGTGATAGTATTCTA
670	TCAGCGGGATATAGGTTCTATGGAAGTACTTGTATTTATATTGGCGTGATAGTATTCTA
6BF	TCAGCGGGATATAGGTTCTATGGAAGTACTTGTATTTATATTGGCGTGATAGTATTCTA
6BSP	TCAGCGGGATATAGGTTCTATGGAAGTACTTGTATTTATATTGGCGTGATAGTATTCTA
19AH	TCAGCGGGATATAGGTTCTATGGAAGTACTTGTATTTATATTGGCGTGATAGTATTCTA
23FPO	TCAGCGGGATATAGGTTCTATGGAAGTACTTGTATTTATATTGGCGTGATAGTATTCTA
19FTW	GTTATAGGCGATCCAATTAATGGTGGATATATTTGGCTTAATTGGAGAGAGAGTATTCTG
9VSP	GTTATAGGCGATCCAATTAATGGTGGATATATTTGGCTTAATTGGAGAGAGAGTATTCTG
TIGR4	GTTATAGGCGATCCAATTAATGGTGGATATATTTGGCTTAATTGGAGAGAGAGTATTCTG
23FTW	GTTATAGGCGATCCAATTAATGGTGGATATATTTGGCTTAATTGGAGAGAGAGTATTCTG
	** ** * * * * *
14CSR	GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
670	GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
6BF	GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
6BSP	GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
19AH	GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
23FPO	GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
19FTW	GCTTATCCGTTTAATTCTAATACTGCTAAAATTACCAATCATGGTGCCCCTACAAGATGG
9VSP	GCTTATCCGTTTAATTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
TIGR4	GCTTATCCGTTTAATTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
23FTW	GCTTATCCGTTTAATTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
	** *****
14CSR	TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
670	TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
6BF	TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
6BSP	TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
19AH	TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
23FPO	TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
19FTW	TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT
9VSP	TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT
TIGR4	TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT
23FTW	TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT
	** *****

14CSR AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT
670 AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT
6BF AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT
6BSP AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT
19AH AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT
23FPO AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT
19FTW AACGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT
9VSP AACGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT
TIGR4 AACGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT
23FTW AACGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT

14CSR TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC
670 TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC
6BF TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC
6BSP TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC
19AH TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC
23FPO TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC
19FTW AAACCTGAAAACCTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT
9VSP AAACCTGAAAACCTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT
TIGR4 AAACCTGAAAACCTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT
23FTW AAACCTGAAAACCTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT

14CSR TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG
670 TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG
6BF TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG
6BSP TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG
19AH TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG
23FPO TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG
19FTW TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG
9VSP TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG
TIGR4 TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG
23FTW TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG
** *** * ** ***** * ** ***** * ** ***** * ** ***** *

14CSR ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC
670 ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC
6BF ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC
6BSP ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC
19AH ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC
23FPO ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC
19FTW ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC
9VSP ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC
TIGR4 ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC
23FTW ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC

14CSR ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA
670 ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA
6BF ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA
6BSP ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA
19AH ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA
23FPO ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA
19FTW ACTTTAACTGCAAACGATGGTAGTCGCTTGGAGAATGGACAAGCTGTAGGTGGTCCACAA
9VSP ACTTTAACTGCAAACGATGGTAGTCGCTTGGAGAATGGACAAGCTGTAGGTGGTCCACAA
TIGR4 ACTTTAACTGCAAACGATGGTAGTCGCTTGGAGAATGGACAAGCTGTAGGTGGTCCACAA
23FTW ACTTTAACTGCAAACGATGGTAGTCGCTTGGAGAATGGACAAGCTGTAGGTGGTCCACAA

14CSR AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
670 AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
6BF AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
6BSP AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
19AH AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
23FPO AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
19FTW AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
9VSP AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT
TIGR4 AATGATGGTGGTTTGTAAAAAATGCAAAAGTGCTCTATGATACGACTGAGAAAAGGATT
23FTW AATGATGGTGGTTTGTAAAAAATGCAAAAGTGCTCTATGATACGACTGAGAAAAGGATT
***** **

14CSR CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
670 CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
6BF CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
6BSP CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
19AH CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
23FPO CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
19FTW CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
9VSP CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC
TIGR4 CGTGTAACAGGTTCTGTACCTTGAACGGATGAAAAAGTTACGTTGACCTACAATGTTTCGT
23FTW CGTGTAACAGGTTCTGTACCTTGAACGGATGAAAAAGTTACGTTGACCTACAATGTTTCGT
***** **

14CSR TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC
670 TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC
6BF TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC
6BSP TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC
19AH TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC
23FPO TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC
19FTW TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC
9VSP TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC
TIGR4 TTGAATGATGAGTTTGTAGCAATAAATTTTATGATACCAATGGTCGAACAACCTTACAT
23FTW TTGAATGATGAGTTTGTAGCAATAAATTTTATGATACCAATGGTCGAACAACCTTACAT
***** *

14CSR CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTA
670 CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTA
6BF CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTA
6BSP CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTA
19AH CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTA
23FPO CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTA
19FTW CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTG
9VSP CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTG
TIGR4 CCTAAGGAAGTAGAACAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTG
23FTW CCTAAGGAAGTAGAACAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTG

14CSR CGAAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
670 CGAAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
6BF CGAAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
6BSP CGAAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
19AH CGAAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
23FPO CGAAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
19FTW CGAAAATATCCAGCAATTACGATTGCAAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT
9VSP CGAAAATATCCAGCAATTACGATTGCAAAAAGAGAAAAAACTTGGTGACATTGAGTTTATT
TIGR4 CGGAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGACATTGAGTTTATT
23FTW CGGAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGACATTGAGTTTATT
** **

Figure 1960

PCT/US05/27239 408/487

14CSR AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
670 AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
6BF AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
6BSP AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
19AH AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
23FPO AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
19FTW AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
9VSP AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
TIGR4 AAGGTCAATAAAAAATGATAAAAAACCACTGAGAGGTGCGGTCTTTAGTCTTCAAAAACAA
23FTW AAGGTCAATAAAAAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA
*** *****

14CSR CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
670 CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
6BF CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
6BSP CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
19AH CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
23FPO CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
19FTW CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
9VSP CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
TIGR4 CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG
23FTW CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG

14CSR AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
670 AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
6BF AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
6BSP AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
19AH AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
23FPO AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
19FTW AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
9VSP AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
TIGR4 AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA
23FTW AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA

14CSR TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
670 TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
6BF TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
6BSP TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
19AH TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
23FPO TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
19FTW TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
9VSP TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
TIGR4 TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC
23FTW TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC

14CSR CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG
670 CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG
6BF CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG
6BSP CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG
19AH CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG
23FPO CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG
19FTW CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG
9VSP CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG
TIGR4 CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG
23FTW CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG

Figure 196P

PCT/US05/27239 409/487

```
14CSR      GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
670        GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
6BF        GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
6BSP       GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
19AH       GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
23FPO      GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA
19FTW      GGTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCTCCAAAGAGA
9VSP       GGTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCTCCAAAGAGA
TIGR4      GGTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCTCCAAAGAGA
23FTW      GGTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCTCCAAAGAGA
***** ** ***** ** ***** ** ***** ** ***** ** ***** **

14CSR      GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
670        GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
6BF        GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
6BSP       GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
19AH       GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
23FPO      GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
19FTW      GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
9VSP       GAATATCCTCGAACTGGTGGTATCGGAATGTTGCTATTCTATCTGATAGGTTGCATGATG
TIGR4      GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
23FTW      GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG
***** ***** ***** ***** ***** ***** ***** ***** *****

14CSR      ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT
670        ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT
6BF        ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT
6BSP       ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT
19AH       ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT
23FPO      ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT
19FTW      ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT
9VSP       ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT
TIGR4      ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT
23FTW      ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT
***** ***** ***** ***** ***** ***** ***** ***** *****

14CSR      AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
670        AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
6BF        AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
6BSP       AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
19AH       AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
23FPO      AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
19FTW      AATATCTATGTTCTGAACAATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
9VSP       AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
TIGR4      AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
23FTW      AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA
***** ** ***** * ***** ***** ***** ***** ***** *****

14CSR      CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
670        CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
6BF        CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
6BSP       CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
19AH       CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
23FPO      CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
19FTW      CTTGGTGAAACCAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
9VSP       CTTGGTGAAACCAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA
TIGR4      CTTGGTGAAACCTGTTTTATTCGT-AAGTAAACTATCATTGAAAGGGGAGATGTTTTCGA
23FTW      CTTGGTGAAACCTGTTTTATTCGT-AAGTAAACTATCATTGAAAGGGGAGATGTTTTCGA
***** * ***** ***** ***** ***** ***** ***** ***** *****
```

Figure 196Q

PCT/US05/27239 410/487

14CSR AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
670 AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
6BF AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
6BSP AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
19AH AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
23FPO AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
19FTW AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
9VSP AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
TIGR4 AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT
23FTW AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT

14CSR TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
670 TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
6BF TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
6BSP TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
19AH TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
23FPO TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
19FTW TGATTTTAAGAGATA--AATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
9VSP TGATTTTAAGAGATA--AATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
TIGR4 TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT
23FTW TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT

14CSR GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC
670 GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC
6BF GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC
6BSP GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC
19AH GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC
23FPO GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC
19FTW GCTTGCTGCCTTATTATTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC
9VSP GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC
TIGR4 GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC
23FTW ACTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTCTCAGCTGCAACAGTTTTTGCGGC

14CSR GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTTAACAATCCATAAGTTACT
670 GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTTAACAATCCATAAGTTACT
6BF GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTTAACAATCCATAAGTTACT
6BSP GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTTAACAATCCATAAGTTACT
19AH GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTTAACAATCCATAAGTTACT
23FPO GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTTAACAATCCATAAGTTACT
19FTW TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT
9VSP TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT
TIGR4 TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT
23FTW GGA-ACAAAA--ACTAAGACACTTACAGTTCATAAATTATTGATGACAGATCAAGAGCT
* * * * *

14CSR GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG
670 GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG
6BF GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG
6BSP GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG
19AH GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG
23FPO GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG
19FTW GGATAAAATTGCAAAATGAGTTAGAAACAGGTAAGTATGCTGGTAATAA-AGTGGGTGTTT
9VSP GGATAAAATTGCAAAATGAGTTAGAAACAGGTAAGTATGCTGGTAATAA-AGTGGGTGTTT
TIGR4 GGATAAAATTGCAAAATGAGTTAGAAACAGGTAAGTATGCTGGTAATAA-AGTGGGTGTTT
23FTW TGAC-----GCTTGGAAATCTGATGCGATTACTACTGCAGGTTATGACGGTTCGCAAAA
* * * * *

Figure 196R

411/487

14CSR GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
670 GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
6BF GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
6BSP GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
19AH GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
23FPO GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT
19FTW TACCTGCA---AATGCAAAAGAAATTGCCGGTGTATGTTTCGTTTGGACAAATACTAATA
9VSP TACCTGCA---AATGCAAAAGAAATTGCCGGTGTATGTTTCGTTTGGACAAATACTAATA
TIGR4 TACCTGCA---AATGCAAAAGAAATTGCCGGTGTATGTTTCGTTTGGACAAATACTAATA
23FTW T-TTTGAA---CAGTTCAAACAACCTTCAAGGTGTTCCACAAG---GAGTAACCGAAATCT
* * * * *

14CSR GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
670 GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
6BF GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
6BSP GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
19AH GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
23FPO GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA
19FTW ATGAAATTATTGATGAAAATGGCCAACTCTAGGAGTGAATATTGATCCACAACATTTA
9VSP ATGAAATTATTGATGAAAATGGCCAACTCTAGGAGTGAATATTGATCCACAACATTTA
TIGR4 ATGAAATTATTGATGAAAATGGCCAACTCTAGGAGTGAATATTGATCCACAACATTTA
23FTW CTGGTGTTC--ATTTCGAGTTACAGAGTTATACGGGTCTCAAGGA--AAAGAACAAGAA
* * * * *

14CSR AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACTAAAGATGG
670 AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACTAAAGATGG
6BF AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACTAAAGATGG
6BSP AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACTAAAGATGG
19AH AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACTAAAGATGG
23FPO AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACTAAAGATGG
19FTW AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG
9VSP AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG
TIGR4 AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG
23FTW AA-TTTAACGAATGATGCGGTTTGGACTGCGGTTAATAAAGGTGTGACGACTGAAACAGG
** * * * * ** * * * *

14CSR ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
670 ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
6BF ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
6BSP ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
19AH ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
23FPO ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC
19FTW AGCTAAATTTAACACGGCAAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG
9VSP AGCTAAATTTAACACGGCAAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG
TIGR4 AGCTAAATTTAACACGGCAAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG
23FTW TGTAAATTTGATACTGAAGTTTACAAGGGAC---ATATCGTCTTGTGCAAGTACGTAA
***** * * * * * * * *

14CSR AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
670 AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
6BF AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
6BSP AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
19AH AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
23FPO AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC
19FTW TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT
9VSP TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT
TIGR4 TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT
23FTW AGAATCGACTTATGTCGGTCCAAATGGTAAAGTTTAAACAGGTATGAAAGCTGTTCTCTGC
* * * * * * * * * * * * * * *

Figure 196S

14CSR	TCTTGTA	ACTCTT	CCACTT	GTGTTA	ACAATA	ATATGGT	TACAGTA	AATTGAT	GCACAT	GTTTTCC
670	TCTTGTA	ACTCTT	CCACTT	GTGTTA	ACAATA	ATATGGT	TACAGTA	AATTGAT	GCACAT	GTTTTCC
6BF	TCTTGTA	ACTCTT	CCACTT	GTGTTA	ACAATA	ATATGGT	TACAGTA	AATTGAT	GCACAT	GTTTTCC
6BSP	TCTTGTA	ACTCTT	CCACTT	GTGTTA	ACAATA	ATATGGT	TACAGTA	AATTGAT	GCACAT	GTTTTCC
19AH	TCTTGTA	ACTCTT	CCACTT	GTGTTA	ACAATA	ATATGGT	TACAGTA	AATTGAT	GCACAT	GTTTTCC
23FPO	TCTTGTA	ACTCTT	CCACTT	GTGTTA	ACAATA	ATATGGT	TACAGTA	AATTGAT	GCACAT	GTTTTCC
19FTW	TGAAATT	GAATTAC	CATT-----	GAACGAT	GTTGTGGA	---	TGCGCAT	GTGTATCC		
9VSP	TGAAATT	GAATTAC	CATT-----	GAACGAT	GTTGTGGA	---	TGCGCAT	GTGTATCC		
TIGR4	TGAAATT	GAATTAC	CATT-----	GAACGAT	GTTGTGGA	---	TGCGCAT	GTGTATCC		
23FTW	TTTAATT	ACTCTG	CCGCTT	GTA	AACCAA	AATGGT	GTTGTAG	AAAATGC	ACATGT	CTATCC
	*	*	*	*	*	*	*	*	*	*
14CSR	TAAAAAT	TCATATA	AATAAA	ACCAGT	TGTAGATA	AAAAGA	AATTGCT	GATACT	TTTGAATT	TATAA
670	TAAAAAT	TCATATA	AATAAA	ACCAGT	TGTAGATA	AAAAGA	AATTGCT	GATACT	TTTGAATT	TATAA
6BF	TAAAAAT	TCATATA	AATAAA	ACCAGT	TGTAGATA	AAAAGA	AATTGCT	GATACT	TTTGAATT	TATAA
6BSP	TAAAAAT	TCATATA	AATAAA	ACCAGT	TGTAGATA	AAAAGA	AATTGCT	GATACT	TTTGAATT	TATAA
19AH	TAAAAAT	TCATATA	AATAAA	ACCAGT	TGTAGATA	AAAAGA	AATTGCT	GATACT	TTTGAATT	TATAA
23FPO	TAAAAAT	TCATATA	AATAAA	ACCAGT	TGTAGATA	AAAAGA	AATTGCT	GATACT	TTTGAATT	TATAA
19FTW	AAAAAAT	ACAGAAG	CAAAGC	CAAAAAT	TGATAA	AGATTT	CAAAGG	TAAAGCAA	ATCCAGA	
9VSP	AAAAAAT	ACAGAAG	CAAAGC	CAAAAAT	TGATAA	AGATTT	CAAAGG	TAAAGCAA	ATCCAGA	
TIGR4	AAAAAAT	ACAGAAG	CAAAGC	CAAAAAT	TGATAA	AGATTT	CAAAGG	TAAAGCAA	ATCCAGA	
23FTW	AAAGAAT	TCTGAAG	ACAAAC	CTACAG	CAACGAA	AACATTT	GATACT	GCAGCAG	GTTTCGT	
	**	***	*	*	**	*	***	*	*	*
14CSR	CGATCAA	-----	AATGGT	CTGTCT	ATCGGT	ACTAAA	ATCCCAT	ATGTTGT	----	TA
670	CGATCAA	-----	AATGGT	CTGTCT	ATCGGT	ACTAAA	ATCCCAT	ATGTTGT	----	TA
6BF	CGATCAA	-----	AATGGT	CTGTCT	ATCGGT	ACTAAA	ATCCCAT	ATGTTGT	----	TA
6BSP	CGATCAA	-----	AATGGT	CTGTCT	ATCGGT	ACTAAA	ATCCCAT	ATGTTGT	----	TA
19AH	CGATCAA	-----	AATGGT	CTGTCT	ATCGGT	ACTAAA	ATCCCAT	ATGTTGT	----	TA
23FPO	CGATCAA	-----	AATGGT	CTGTCT	ATCGGT	ACTAAA	ATCCCAT	ATGTTGT	----	TA
19FTW	TACACC	ACGTGT	AGATAA	AGATAC	ACCTGT	GAACC	ACCAAG	TGGAGAT	GTTGTAG	AGTA
9VSP	TACACC	ACGTGT	AGATAA	AGATAC	ACCTGT	GAACC	ACCAAG	TGGAGAT	GTTGTAG	AGTA
TIGR4	TACACC	ACGTGT	AGATAA	AGATAC	ACCTGT	GAACC	ACCAAG	TGGAGAT	GTTGTAG	AGTA
23FTW	AGATCC	AGGTG---	AAAAAG	GTTTAG	CAATTG	GCAC	TAAGGT	ACCGTAT	ATTGT---	TA
	*	*	*	*	*	*	*	*	*	*
14CSR	ATACAACA	AATTC	CAAGTA	AATGCA	AACATT	-----	TGCAACT	TCATTTT	GGTCAG	ATG
670	ATACAACA	AATTC	CAAGTA	AATGCA	AACATT	-----	TGCAACT	TCATTTT	GGTCAG	ATG
6BF	ATACAACA	AATTC	CAAGTA	AATGCA	AACATT	-----	TGCAACT	TCATTTT	GGTCAG	ATG
6BSP	ATACAACA	AATTC	CAAGTA	AATGCA	AACATT	-----	TGCAACT	TCATTTT	GGTCAG	ATG
19AH	ATACAACA	AATTC	CAAGTA	AATGCA	AACATT	-----	TGCAACT	TCATTTT	GGTCAG	ATG
23FPO	ATACAACA	AATTC	CAAGTA	AATGCA	AACATT	-----	TGCAACT	TCATTTT	GGTCAG	ATG
19FTW	CGA-AAT	TGTTAC	AAAAAT	TCCAGC	ACTTGCT	AATTAT	TGCAAC	AGCAAAC	TGGAGC	GATA
9VSP	CGA-AAT	TGTTAC	AAAAAT	TCCAGC	ACTTGCT	AATTAT	TGCAAC	AGCAAAC	TGGAGC	GATA
TIGR4	CGA-AAT	TGTTAC	AAAAAT	TCCAGC	ACTTGCT	AATTAT	TGCAAC	AGCAAAC	TGGAGC	GATA
23FTW	CAACAAC	TATTCG	AAAAAC	TCAACT	CT-----	TGCAAC	AGCTTT	CTGGT	CAGATG	
	*	*	*	*	*	*	*	*	*	*
14CSR	AAATGAC	AGAAGG	TCTAACT	TATAAT	GAAGA-	GTAACAA	----	TTACTTT	TGAATA	ATGTAG
670	AAATGAC	AGAAGG	TCTAACT	TATAAT	GAAGA-	GTAACAA	----	TTACTTT	TGAATA	ATGTAG
6BF	AAATGAC	AGAAGG	TCTAACT	TATAAT	GAAGA-	GTAACAA	----	TTACTTT	TGAATA	ATGTAG
6BSP	AAATGAC	AGAAGG	TCTAACT	TATAAT	GAAGA-	GTAACAA	----	TTACTTT	TGAATA	ATGTAG
19AH	AAATGAC	AGA								

Figure 196T

Figure 196U

414/487

14CSR		GGGTGAAAGCGACTGTTCAACTTGTAATGCCAAGACTGGTGAGAAAGTCGGTGCTCC---
670		GGGTGAAAGCGACTGTTCAACTTGTAATGCCAAGACTGGTGAGAAAGTCGGTGCTCC--
6BF		GGGTGAAAGCGACTGTTCAACTTGTAATGCCAAGACTGGTGAGAAAGTCGGTGCTCC--
6BSP		GGGTGAAAGCGACTGTTCAACTTGTAATGCCAAGACTGGTGAGAAAGTCGGTGCTCC--
19AH		GGGTGAAAGCGACTGTTCAACTTGTAATGCCAAGACTGGTGAGAAAGTCGGTGCTCC--
23FPO		GGGTGAAAGCGACTGTTCAACTTGTAATGCCAAGACTGGTGAGAAAGTCGGTGCTCC--
19FTW		GAGCTGAAGCAACGTTTCGATTTGGTTAATGCTCAGACTGGTAAAGTTGTACAAAC-----
9VSP		GAGCTGAAGCAACGTTTCGATTTGGTTAATGCTCAGACTGGTAAAGTTGTACAAAC-----
TIGR4		GAGCTGAAGCAACGTTTCGATTTGGTTAATGCTCAGACTGGTAAAGTTGTACAAAC-----
23FTW		GTGTAGAAGTAACTTTTGATTTGGTAAATGCTCAGACAGGTGAGGTCGTTAAAGTACCTG * * *** * * * * * * * * *
14CSR		-----TGTAGAACTTTC---AGAAAATAATTGGACATATACTTGGAGTGGGC
670		-----TGTAGAACTTTC---AGAAAATAATTGGACATATACTTGGAGTGGGC
6BF		-----TGTAGAACTTTC---AGAAAATAATTGGACATATACTTGGAGTGGGC
6BSP		-----TGTAGAACTTTC---AGAAAATAATTGGACATATACTTGGAGTGGGC
19AH		-----TGTAGAACTTTC---AGAAAATAATTGGACATATACTTGGAGTGGGC
23FPO		-----TGTAGAACTTTC---AGAAAATAATTGGACATATACTTGGAGTGGGC
19FTW		-----TGTAAC TTTGAC---AACAGACAAAAATACAGTTACTGTTAACGGAT
9VSP		-----TGTAAC TTTGAC---AACAGACAAAAATACAGTTACTGTTAACGGAT
TIGR4		-----TGTAAC TTTGAC---AACAGACAAAAATACAGTTACTGTTAACGGAT
23FTW		GACATGAAACAGGTATTGTATTGAATCAAACAATAATTGGACATTTACTGCTACAGGTC * * * * * * * *** **** * **
14CSR		TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
670		TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
6BF		TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
6BSP		TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
19AH		TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
23FPO		TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
19FTW		TGGATAAAAATACAGAATATAAATTCGTTGAACGTAGTATAAAAGGGTATT CAGCAGATT
9VSP		TGGATAAAAATACAGAATATAAATTCGTTGAACGTAGTATAAAAGGGTATT CAGCAGATT
TIGR4		TGGATAAAAATACAGAATATAAATTCGTTGAACGTAGTATAAAAGGGTATT CAGCAGATT
23FTW		TTGATAATAATACAGAATATAAATTTGTTGAACGGACAATTAAGGGATATTCTGCAGATT * ***** ** ***** *** * * *** * ** ** ** ** ** ** ** *
14CSR		ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
670		ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
6BF		ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
6BSP		ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
19AH		ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
23FPO		ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
19FTW		ATCAAGAAATCACTACAGCTGGAGAAATTGCTGTCAAGA ACTGGAAAGACGAAAAATCCAA
9VSP		ATCAAGAAATCACTACAGCTGGAGAAATTGCTGTCAAGA ACTGGAAAGACGAAAAATCCAA
TIGR4		ATCAAGAAATCACTACAGCTGGAGAAATTGCTGTCAAGA ACTGGAAAGACGAAAAATCCAA
23FTW		ACCAAACAATTACTGAAACAGGAAAAAATTGCTGTTAAAAACTGGAAAGATGAAAAATCCAG * * * * * ** * * * ** ** ***** * ** ***
14CSR		CTCCAATCAATC-TGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
670		CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
6BF		CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
6BSP		CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
19AH		CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
23FPO		CTCCAATCAATCTTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
19FTW		AACCACTTGATCCAACAGAGCCAAAAGTTGTTACATATGGTAAAAAGTTTGTCAAAGTTA
9VSP		AACCACTTGATCCAACAGAGCCAAAAGTTGTTACATATGGTAAAAAGTTTGTCAAAGTTA
TIGR4		AACCACTTGATCCAACAGAGCCAAAAGTTGTTACATATGGTAAAAAGTTTGTCAAAGTTA
23FTW		AACCAATAAATCCTGAAGAGCCACGTGTAAAAACATATGGTAAAAAATTCGTTAAGTTG *** * *** *** *** * ***** *** ** ** *

Figure 196V

Figure 196W

PCT/US2005/027239 416/487

14CSR TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA
670 TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA
6BF TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA
6BSP TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA
19AH TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA
23FPO TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA
19FTW ATTAGTTTCTGATGCACAAGGTCGCTTTGAAATTACAGGCCTTCTTGCAGGTACATATTA
9VSP ATTAGTTTCTGATGCACAAGGTCGCTTTGAAATTACAGGCCTTCTTGCAGGTACATATTA
TIGR4 ATTAGTTTCTGATGCACAAGGTCGCTTTGAAATTACAGGCCTTCTTGCAGGTACATATTA
23FTW TCTTACTTCTAACACTGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGAAGCTACAC
* * * * *

14CSR ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
670 ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
6BF ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
6BSP ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
19AH ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
23FPO ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT
19FTW CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAAGTCCGTCAGAAATTTGA
9VSP CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAAGTCCGTCAGAAATTTGA
TIGR4 CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAAGTCCGTCAGAAATTTGA
23FTW GTTGAAGAAACAAAAGCTCCAGAAGGCTTTGCAAACT---TGGAGATGTGAAGTTTGA
* * * * *

14CSR TGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
670 TGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
6BF TGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
6BSP TGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
19AH TGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
23FPO TGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
19FTW AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG
9VSP AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG
TIGR4 AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG
23FTW GGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA
* * * * *

14CSR AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT
670 AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT
6BF AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT
6BSP AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT
19AH AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT
23FPO AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACGATCCCACAAACGGGTGGTAT
19FTW TAAAGATGACGCTACAAAAGTAGTCAACAAAAAAATCACGATCCCACAAACGGGTGGTAT
9VSP TAAAGATGACGCTACAAAAGTAGTCAACAAAAAAATCACGATCCCACAAACGGGTGGTAT
TIGR4 TAAAGATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT
23FTW GAAGAACGACGCTACAAAAGTAGTCAACAAAAAAATCACGATCCCTCAAACGGGTGGTAT
* * * * *

14CSR TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
670 TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
6BF TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
6BSP TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
19AH TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
23FPO TGGTACAATTATCTTTGCTGTAGCAGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA
19FTW TGGTACAATTATCTTTGCTGTAGCAGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA
9VSP TGGTACAATTATCTTTGCTGTAGCAGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA
TIGR4 TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA
23FTW TGGTACAATTATCTTTGCTGTAGCGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA
* * * * *

Figure 196X

14CSR	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
670	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
6BF	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
6BSP	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
19AH	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
23FPO	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
19FTW	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
9VSP	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
TIGR4	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
23FTW	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA

14CSR	TGACAATGCAGAAAATGCAGAAAATG-----
670	TGACAATGCAGAAAATGCAGAAAATG-----
6BF	TGACAATGCAGAAAATGCAGAAAATG-----
6BSP	TGACAATGCAGAAAATGCAGAAAATG-----
19AH	TGACAATGCAGAAAATGCAGAAAATG-----
23FPO	TGACAATGCAGAAAATGCAGAAAATG-----
19FTW	TGACAATGCAGAAAATGCAGAAAATG-----
9VSP	TGACAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAA
TIGR4	TGACAATGCAGAAAATGCAGAAAATG-----
23FTW	TGACAATGCAGAAAATGCAGAAAATG-----

14CSR	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
670	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
6BF	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
6BSP	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
19AH	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
23FPO	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
19FTW	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
9VSP	TGATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
TIGR4	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
23FTW	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG

14CSR	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
670	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
6BF	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
6BSP	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
19AH	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
23FPO	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
19FTW	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
9VSP	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
TIGR4	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
23FTW	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG

14CSR	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
670	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
6BF	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
6BSP	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
19AH	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
23FPO	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
19FTW	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
9VSP	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
TIGR4	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT
23FTW	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTCGT

Figure 196Y

14CSR ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTTCGTGGGATGAGAATAAAC
670 ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTTCGTGGGATGAGAATAAAC
6BF ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTTCGTGGGATGAGAATAAAC
6BSP ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTTCGTGGGATGAGAATAAAC
19AH ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTTCGTGGGATGAGAATAAAC
23FPO ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTTCGTGGGATGAGAATAAAC
19FTW ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTTCGTGGGATGAGAATAAAC
9VSP ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTTCGTGGGATGAGAATAAAC
TIGR4 ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTTCGTGGGATGAGAATAAAC
23FTW ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTTCGTGGGATGAGAATAAAC

14CSR TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
670 TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
6BF TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
6BSP TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
19AH TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
23FPO TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
19FTW TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
9VSP TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
TIGR4 TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT
23FTW TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT

14CSR CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
670 CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
6BF CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
6BSP CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
19AH CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
23FPO CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
19FTW CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
9VSP CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
TIGR4 CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT
23FTW CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT

14CSR ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
670 ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
6BF ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
6BSP ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
19AH ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
23FPO ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
19FTW ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
9VSP ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
TIGR4 ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG
23FTW ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG

14CSR CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
670 CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
6BF CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
6BSP CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
19AH CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
23FPO CGAAAAAAGCAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
19FTW CGAAAAAAGCAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
9VSP CGAAAAAAGCAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
TIGR4 CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA
23FTW CGAAAAAAGCAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA

Figure 196X

14CSR ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
670 ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
6BF ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
6BSP ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
19AH ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
23FPO ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
19FTW ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
9VSP ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
TIGR4 ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG
23FTW ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG

14CSR AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
670 AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
6BF AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
6BSP AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
19AH AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
23FPO AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
19FTW AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
9VSP AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
TIGR4 AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT
23FTW AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT

14CSR ATACTGATAAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
670 ATACTGATAAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
6BF ATACTGATAAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
6BSP ATACTGATAAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
19AH ATACTGATAAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
23FPO ATACTGATAAAAAATGGAGAGATTTGTTGTGACAAATCTTCCTCTTGGGACCTATCGTTTCA
19FTW ATACTGATAAAAAATGGAGAGATTTGTTGTGACAAATCTTCCTCTTGGGACCTATCGTTTCA
9VSP ATACTGATAAAAAATGGAGAGATTTGTTGTGACAAATCTTCCTCTTGGGACCTATCGTTTCA
TIGR4 ATACTGATAAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA
23FTW ATACTGATAAAAAATGGAGAGATTTGTTGTGACAAATCTTCCTCTTGGGACCTATCGTTTCA

14CSR AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
670 AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
6BF AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
6BSP AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
19AH AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
23FPO AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG
19FTW AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG
9VSP AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG
TIGR4 AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG
23FTW AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG

14CSR TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
670 TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
6BF TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
6BSP TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
19AH TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
23FPO TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
19FTW TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
9VSP TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
TIGR4 TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG
23FTW TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG

Figure 196AA

PCT/US05/27239 420/487

14CSR ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
670 ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
6BF ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
6BSP ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
19AH ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
23FPO ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
19FTW ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
9VSP ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
TIGR4 ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA
23FTW ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA

14CSR TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
670 TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
6BF TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
6BSP TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
19AH TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
23FPO TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG
19FTW TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG
9VSP TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG
TIGR4 TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA
23FTW TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG

14CSR CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
670 CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
6BF CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
6BSP CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
19AH CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
23FPO CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
19FTW CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
9VSP CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
TIGR4 CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT
23FTW CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT

14CSR GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
670 GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
6BF GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
6BSP GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
19AH GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
23FPO GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
19FTW GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
9VSP GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
TIGR4 GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG
23FTW GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG

14CSR GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
670 GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
6BF GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
6BSP GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
19AH GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
23FPO GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
19FTW GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
9VSP GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
TIGR4 GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG
23FTW GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG

Figure 196AB

PCT/US2005/027239

14CSR ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
670 ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
6BF ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
6BSP ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
19AH ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
23FPO ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
19FTW ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
9VSP ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
TIGR4 ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT
23FTW ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTGCCATTTTGTGT

14CSR TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
670 TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
6BF TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
6BSP TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
19AH TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
23FPO TTGGTAGTGGCTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
19FTW TTGGTAGTGGCTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
9VSP TTGGTAGTGGCTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
TIGR4 TTGGTAGTGGCTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA
23FTW TTGGTAGTGGCTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA

14CSR TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
670 TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
6BF TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
6BSP TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
19AH TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
23FPO TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
19FTW TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
9VSP TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
TIGR4 TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA
23FTW TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA

14CSR TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
670 TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
6BF TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
6BSP TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
19AH TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
23FPO TCATGGTGATTTGGCATGAATCATAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
19FTW TCATGGTGATTTGGCATGAATCATAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
9VSP TCATGGTGATTTGGCATGAATCATAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
TIGR4 TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC
23FTW TCATGGTGATTTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC

14CSR TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
670 TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
6BF TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
6BSP TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
19AH TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
23FPO TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
19FTW TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
9VSP TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
TIGR4 TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG
23FTW TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG

Figure 196AC

422/487

14CSR ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG
670 ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG
6BF ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG
6BSP ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG
19AH ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG
23FPO ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG
19FTW ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG
9VSP ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG
TIGR4 ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG
23FTW ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG

14CSR TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
670 TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
6BF TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
6BSP TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
19AH TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
23FPO TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGTT
19FTW TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGTT
9VSP TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGTT
TIGR4 TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT
23FTW TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT

14CSR AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT
670 AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT
6BF AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT
6BSP AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT
19AH AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT
23FPO AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAGCAAAAACGAAACAATCTCCTATT
19FTW AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAGCAAAAACGAAACAATCTCCTATT
9VSP AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAGCAAAAACGAAACAATCTCCTATT
TIGR4 AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT
23FTW AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT

14CSR AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
670 AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
6BF AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
6BSP AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
19AH AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
23FPO AGGAGTGGTATTTTTTCATTGGAATAGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
19FTW AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
9VSP AGGAGTGGTATTTTTTCATTGGAATAGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
TIGR4 AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA
23FTW AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA

14CSR TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
670 TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
6BF TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
6BSP TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
19AH TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
23FPO TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
19FTW TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
9VSP TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
TIGR4 TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA
23FTW TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA

Figure 196AD

PCT/US05/27239 423/487

14CSR TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
670 TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
6BF TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
6BSP TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
19AH TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
23FPO TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
19FTW TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
9VSP TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
TIGR4 TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA
23FTW TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA

14CSR TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
670 TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
6BF TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
6BSP TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
19AH TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
23FPO TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
19FTW TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
9VSP TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
TIGR4 TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC
23FTW TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC

14CSR ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
670 ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
6BF ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
6BSP ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
19AH ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
23FPO ACGCATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCTGCTATTGATGTAGA
19FTW ACGCATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCTGCTATTGATGTAGA
9VSP ACGCATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCTGCTATTGATGTAGA
TIGR4 ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
23FTW ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA
*** ***** *

14CSR TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
670 TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
6BF TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
6BSP TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
19AH TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
23FPO TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
19FTW TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
9VSP TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
TIGR4 TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA
23FTW TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA

14CSR GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
670 GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
6BF GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
6BSP GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
19AH GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
23FPO GGGAACTTCTCTACCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
19FTW GGGAACTTCTCTACCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
9VSP GGGAACTTCTCTACCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
TIGR4 GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG
23FTW GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG

Figure 196AE

PCT/US05/27239

424/487

14CSR TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT
670 TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT
6BF TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT
6BSP TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT
19AH TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT
23FPO TTTGCCAACGGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT
19FTW TTTGCCAACGGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT
9VSP TTTGCCAACGGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT
TIGR4 TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT
23FTW TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT
***** **

14CSR TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
670 TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
6BF TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
6BSP TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
19AH TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
23FPO TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
19FTW TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
9VSP TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
TIGR4 TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC
23FTW TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC

14CSR GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
670 GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
6BF GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
6BSP GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
19AH GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
23FPO GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
19FTW GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
9VSP GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
TIGR4 GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
23FTW GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG
***** **

14CSR TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT
670 TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT
6BF TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT
6BSP TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT
19AH TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT
23FPO TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT
19FTW TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT
9VSP TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT
TIGR4 TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT
23FTW TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT

14CSR AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT
670 AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT
6BF AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT
6BSP AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT
19AH AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT
23FPO AGCAGAGGTTGAGGAAGAATTTATTGCGGCAAACAACTCAGTCATCTCTATCGCTACCT
19FTW AGCAGAGGTTGAGGAAGAATTTATTGCGGCAAACAACTCAGTCATCTCTATCGCTACCT
9VSP AGCAGAGGTTGAGGAAGAATTTATTGCGGCAAACAACTCAGTCATCTCTATCGCTACCT
TIGR4 AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT
23FTW AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT

Figure 196AF

14CSR GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
670 GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
6BF GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
6BSP GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
19AH GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
23FPO GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
19FTW GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
9VSP GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
TIGR4 GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA
23FTW GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA

14CSR GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
670 GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
6BF GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
6BSP GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
19AH GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
23FPO GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA
19FTW GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA
9VSP GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA
TIGR4 GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA
23FTW GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA

14CSR GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAAGGCACAAAAAAGAAGAAACATC
670 GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAAGGCACAAAAAAGAAGAAACATC
6BF GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAAGGCACAAAAAAGAAGAAACATC
6BSP GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAAGGCACAAAAAAGAAGAAACATC
19AH GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAAGGCACAAAAAAGAAGAAACATC
23FPO GGTAGAGGATGAGTAAGAGTAGATATTACGAAAAAAGAGCGTGAAAAAGAAGAAAAATC
19FTW GGTAGAGGATGAGTAAGAGTAGATATTACGAAAAAAGAGCGTGAAAAAGAAGAAAAATC
9VSP GGTAGAGGATGAGTAAGAGTAGATATTACGAAAAAAGAGCGTGAAAAAGAAGAAAAATC
TIGR4 GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAAGGCACAAAAAAGAAGAAACATC
23FTW GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAAGGCACAAAAAAGAAGAAACATC
*** *****

14CSR CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
670 CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
6BF CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
6BSP CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
19AH CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
23FPO CGTTCATTCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
19FTW CGTTCATTCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
9VSP CGTTCATTCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
TIGR4 CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
23FTW CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT
** * *

14CSR CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
670 CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
6BF CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
6BSP CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
19AH CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
23FPO CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
19FTW CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
9VSP CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
TIGR4 CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT
23FTW CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT

Figure 196AG

14CSR CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
670 CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
6BF CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
6BSP CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
19AH CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
23FPO CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
19FTW CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
9VSP CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
TIGR4 CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA
23FTW CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA

14CSR CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
670 CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
6BF CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
6BSP CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
19AH CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
23FPO CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
19FTW CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGATCAGGAAAAAGAAACAGGGAGTTT
9VSP CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
TIGR4 CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT
23FTW CCTTGAAACCATCTGAAATTCCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT

14CSR CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
670 CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
6BF CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
6BSP CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
19AH CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
23FPO CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
19FTW CAGAAATATGCTAACATGCTAAAGGTTCATGAGCGTATCGGATATGTAGAAATTCCTGCGA
9VSP CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
TIGR4 CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA
23FTW CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA

14CSR TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
670 TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
6BF TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
6BSP TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
19AH TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
23FPO TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
19FTW TTGAACAGGAAATCCCATGTATGTTGGCACAAGTGAAGACATTCCTCAGAAAGGGGCGCAG
9VSP TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
TIGR4 TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG
23FTW TTGATCAGGAAATTCCGATGTATGTCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG

14CSR GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
670 GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
6BF GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
6BSP GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
19AH GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
23FPO GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
19FTW GGCTGTTAGAAGGGGCTTCGCTGCCTGTTGGAGGTGAAAATACCCATACAGTGATCACTG
9VSP GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
TIGR4 GGCTGTTAGAAGGGGCTTCGCTGCCTGTTGGAGGTGAAAATACCCATACAGTGATCACTG
23FTW GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAAAATACCCACACAGTTGTCACTG
* * * * *

Figure 196AH

PCT/US2005/027239

427/487

14CSR CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
670 CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
6BF CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
6BSP CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
19AH CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
23FPO CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
19FTW CTCACAGAGGATTGCCAACGGCAGAACTGTTTCAAGTCAATTGGATAAGATGAAGAAAGGGG
9VSP CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG
TIGR4 CTCACAGAGGATTGCCAACGGCAGAACTGTTTCAAGTCAATTGGATAAGATGAAAAAAGGGG
23FTW CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG

14CSR ATGTCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA
670 ATGTCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA
6BF ATGTCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA
6BSP ATGTCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA
19AH ATGTCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA
23FPO ATATCTTTTATCTTCACGTTTGTAGATCAGGTGTTGGCCTACCAAGTGGATCAGATAGTGA
19FTW ATATCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTATCAAGTGGATCAGATAGTGA
9VSP ATATCTTTTATCTTCACGTTTGTAGATCAGGTGTTGGCCTACCAAGTGGATCAGATAGTGA
TIGR4 ATATCTTTTATCTTCACGTTTGTAGATCAGGTGTTGGCCTACCAAGTGGATCAGATAGTGA
23FTW ATGTCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA
**

14CSR CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
670 CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
6BF CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
6BSP CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
19AH CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
23FPO CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
19FTW CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
9VSP CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
TIGR4 CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT
23FTW CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT

14CSR TGTTGACCTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
670 TGTTGACCTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
6BF TGTTGACCTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
6BSP TGTTGACCTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
19AH TGTTGACCTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
23FPO TGTTGACTTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
19FTW TACTGACTTGTACGCCATACATGATTAAACAGCCACCGTTTGTGGTACGTGGGAAACGGA
9VSP TGTTGACTTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
TIGR4 TGTTGACTTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
23FTW TGTTGACCTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA
* *****

14CSR TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
670 TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
6BF TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
6BSP TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
19AH TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
23FPO TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
19FTW TTCCATATACAGCGCCGATTGCTGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
9VSP TTCCGTATACGGCACCAATTGCAGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
TIGR4 TTCCGTATACGGCACCAATTGCAGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT
23FTW TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT

Figure 196I

428/487

Figure 196AJ

PCT/US05/27239 429/487

14CSR CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
670 CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
6BF CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
6BSP CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
19AH CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT
23FPO CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
19FTW CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
9VSP CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
TIGR4 CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT
23FTW CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT

14CSR TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGA
670 TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGA
6BF TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGA
6BSP TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGA
19AH TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGA
23FPO TACCAAGTGTCTGACGACCCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGA
19FTW TACCAAGTGTCTGACGACCCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGA
9VSP TACCAAGTGTCTGACGACCCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGA
TIGR4 TACCAAGTGTCTGACGACCCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGA
23FTW TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGA

14CSR ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
670 ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
6BF ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
6BSP ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
19AH ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT
23FPO ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
19FTW ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
9VSP ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
TIGR4 ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT
23FTW ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT

14CSR GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTTCGTTCAAGTGATTGCTGGGCAC
670 GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTTCGTTCAAGTGATTGCTGGGCAC
6BF GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTTCGTTCAAGTGATTGCTGGGCAC
6BSP GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTTCGTTCAAGTGATTGCTGGGCAC
19AH GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTTCGTTCAAGTGATTGCTGGGCAC
23FPO GTGGATGGTACACCGCTGCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC
19FTW GTGGATGGTACACCGCTGCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC
9VSP GTGGATGGTACACCGCTGCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC
TIGR4 GTGGATGGTACACCGCTGCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC
23FTW GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTTCGTTCAAGTGATTGCTGGGCAC

14CSR CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
670 CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
6BF CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
6BSP CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
19AH CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
23FPO CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
19FTW CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
9VSP CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
TIGR4 CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT
23FTW CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT

Figure 196AK

PCT/US2005/027239

430/487

14CSR CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
670 CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
6BF CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
6BSP CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
19AH CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
23FPO CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
19FTW CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
9VSP CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
TIGR4 CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT
23FTW CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT

14CSR TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
670 TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
6BF TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
6BSP TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
19AH TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
23FPO TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
19FTW TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
9VSP TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
TIGR4 TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA
23FTW TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA

14CSR ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
670 ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
6BF ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
6BSP ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
19AH ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
23FPO ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
19FTW ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
9VSP ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
TIGR4 ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT
23FTW ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT

14CSR GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
670 GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
6BF GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
6BSP GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
19AH GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
23FPO GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
19FTW GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
9VSP GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
TIGR4 GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA
23FTW GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA

14CSR GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
670 GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
6BF GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
6BSP GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
19AH GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
23FPO GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
19FTW GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
9VSP GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
TIGR4 GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG
23FTW GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG

Figure 196AL

PCT/US05/27239

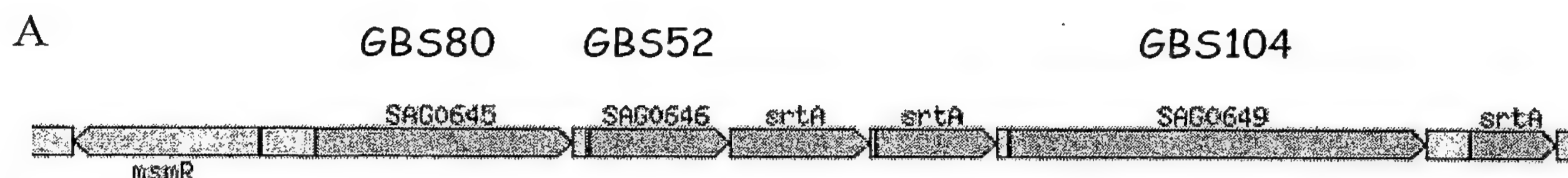
431/487

14CSR	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
670	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
6BF	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
6BSP	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
19AH	GCATTTATGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
23FPO	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
19FTW	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
9VSP	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
TIGR4	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
23FTW	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA

14CSR	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAGGGG
670	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAGTGG
6BF	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAG---
6BSP	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAG---
19AH	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAG---
23FPO	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGT-----
19FTW	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAGT--
9VSP	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAG---
TIGR4	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAGTGG
23FTW	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTA----

Figure 196AM

Figure 197



B

Intergenic region between AraC R and GBS 80

AraC...CAT

TTGATAGACCGCCTTCATTATCATTTCTAGAATTTTTCTTTAGGTTTGTA
AAGACTACAAAATAAAAATGATGAAAACAACCTATCTTGTGGATACACTAAA
AAGACACGCTAATTAGCAAACCTCTCTCTTCATCATCTCTCACCATTATTA
TACTAC **TATTTATAT**GACAAATAAAGGT**G**ATTT **TGTTAA**AATATACTTT
GAAAATCCACATATATTTTAAATCTTCCGTCTG**AAAAAA**TAAATAAAAAT
AGTAAAAATAAACACGAATTTAAAATAAGCAAATTTTTTAAGAAAATCTG
TGCTAAACTTTAATAGTTTTTGCTTAATAATAATCAGCACTTACAAAGA
ACAAAGGGGAAAAGCGAG**GGAGAGA**ACTTTTA **ATG... GBS80**

C

187	4A		5A		5A
233	6A		6A		7A
Strain	FACS α -80	Strain	FACS α -80	Strain	FACS α -80
1998	95	5364	454	2129	57
2110	0	JMV071	556	2274	113
2603	62	JM91003	587	5401	170
3050	43	CJB111	365	5408	0
5376	165			5518	31
M781	65			CJB110	71
COH1	305 (G→T 179)			J7357B	91
18rs 21	0 (STOP, no LPXTG)			COH31	0

AI-1											
			aa	M1	M3	M5	M18	M49	M6	M12	
M6											
50913503	M6_Spy0157	LPXTG	628	gas15 30%in593aa	M3-0098 46%in256aa M3-0104 28%in563aa		M18-0132 24%in701aa			M12-4134 74%in703aa	Fibronecti n-binding protein (protein F)
50913505	M6_Spy0159	LPXSG	1037		M3-0104 25%in339aa					M12-4141 37%in98aa	Collagen adhesion protein
50913506	M6_Spy0160	LPXTG	557								Fimbrial structural subunit

Figure 198

434/487

AI-2										
			aa	M1	M3	M5	M18	M49	M6	M12
M1										
gas15	gas15	VVXTG	762		M3-0098 50%in738aa	M5-orf78 60%in462aa	M18-0126 54%in469aa			M12-4135 54%in747aa
13621428	SPY0128 gas16	EVXTG	340		M3-0100 40%in354aa	M5-orf80 41%in358aa	M18-0128 38%in357aa			M12-4137 40%in354aa
13621430	SPY0130 gas18	LPXTG	215		M3-0102 32%200aa	M5-orf82 31%in213aa	M18-0130 32%in213aa			M12-4139 31%in206aa
										Cpa
										hypothetic al protein (fimbrial)
										hypothetic al protein

Figure 199

AI-3										
			aa	M1	M3	M5	M18	M49	M6	M12
M3										
21909634	SpyM3_0098	VPXTG	744	gas15 51%in739aa		M5-orf78 58%in484aa	M18-0126 74%in482aa			M12-4135 55%in751aa
21909636	SpyM3_0100	QVXTG	344	gas16 40%in354aa		M5-orf80 64%in349aa	M18-0128 67%in345aa			M12-4137 61%in344aa
21909638	SpyM3_0102	LPXAG	195	gas18 32%in200aa		M5-orf82 98%in183aa	M18-0130 97%in183aa			M12-4139 99%in183aa
21909640	SpyM3_0104	LPXTG	696			M5-orf84 88%in656aa	M18-0132 88%in656aa			M12-4141 59%in612aa
										putative collagen binding protein (Cpb)
										conserved hypothetical al protein (fimbrial)
										hypothetical protein
										protein F2 like fibronectin-binding

Figure 200A

M18																			
19745301	spyM18_0126	VPXTG	524	gas15 54%in469aa	M3-0098 74%in482	M5-orf78 61%in528aa													putative collagen binding protein (Cpb)
19745303	spyM18_0128	QVXTG	344	gas16 38%in357aa	M3-0100 67%in345aa	M5-orf80 60%in349aa													conserved hypothetic al protein (fimbrial)
19745305	spyM18_0130	LPXAG	195	gas18 32%in213aa	M3-0102 97%in189aa	M5-orf82 99%in195aa													hypothetic al protein
19745307	spyM18_0132	LPXTG	696		M3-0104 88%in656aa	M5-orf84 100%in696aa													protein F2 like fibronectin -binding

Figure 200B

Figure 200C

Figure 200C

M49												
56808848	VPXTG	744	gas15 55%in738aa	M3-0098 72%in743aa	M5-orf78 78%in483	M18-0126 61% in484				M12-4135 73%in752aa	putative collagen binding protein (Cpb)	
56808846	QVXTG	344	gas16 36%in355aa	M3-0100 66%in345aa	M5-orf80 61%in349aa	M18-0128 90%in344aa				M12-4137 62%in344aa	conserved hypothetic al protein (fimbrial)	
56808844	LPXAG	189	gas18 31%in206aa	M3-102 98%in189aa	M5-orf82 98%in189aa	M18-0130 98%in189aa				M12-4139 98%in189aa	hypothetic al protein	
56808842	LPXTG	1160		M3-104 59%in612aa	M5-orf84 50%in701aa	M18-0132 50%in701aa		M6-0157 32%in296aa	M12-4141 91%in1164aa	protein F2 like fibronectin -binding		

Figure 200D

439/487

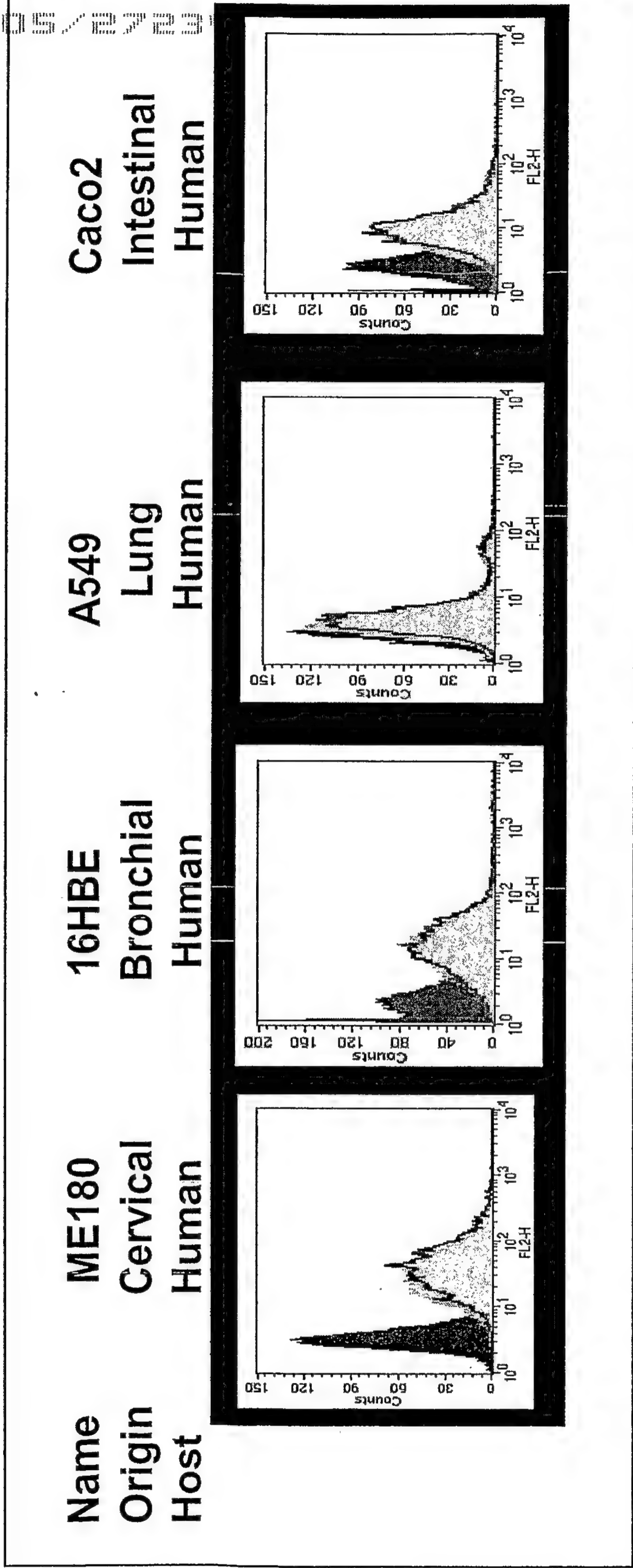
AI-4											
			aa	M1	M3	M5	M18	M49	M6	M12	
M12											
19224134		LPXTG	698	gas15 44%in297aa	M3-0098 49%in254aa				M6-0157 74%in703aa		protein F
19224135		VPXTG	756	gas15 54%in747aa	M3-0098 55%in751aa	orf78 80%in484aa	M18-0126 59%in483aa		M6-0157 51%in275aa		Cpa
19224137		QVXTG	342	gas16 40%in354aa	M3-0100 61%in344aa	orf80 65%in384aa	M18-0128 62%in344aa				EflSLA (fimbria)
19224139		LPXAG	189	gas18 31%in206aa	M3-0102 99%in183aa	orf82 98%in189aa	M18-130 97%in189aa				Orf2
19224141		LPXTG	1161		M3-0104 59%in612aa	orf84 50%in701aa	M18-0132 50%in701aa				protein F2

Figure 201

Figure 202

WO 2006/078318
PCT/US2005/027239

3S80 recombinant protein does not bind to epithelial cells

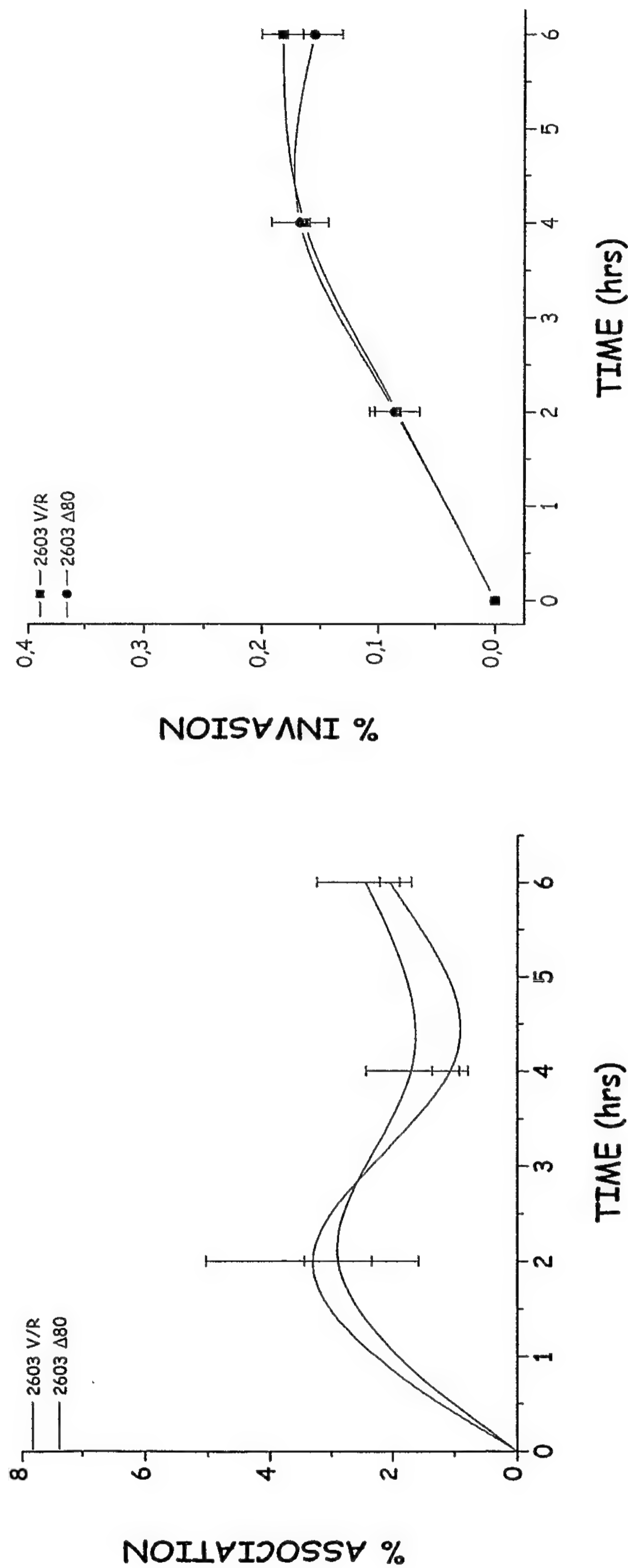


PCT/US2005/027239

Epithelial cells were incubated in the presence or absence of GBS80 protein and then a mouse a-GBS80 polyclonal antibody added. The cell were then stained with FITC-conjugated a-mouse IgG antibody. The violet area indicates cells treated with FITC-conjugated antibody alone. GBS80 binding, expressed as Dmean channel values, was measured by FACScan cytometer as difference in fluorescence intensity between cell incubated with or without GBS80. The same protocol was used for GBS101 protein binding to epithelial cells

Figure 203

Deletion of GBS80 protein does not affect the ability of GBS to adhere and invade ME180

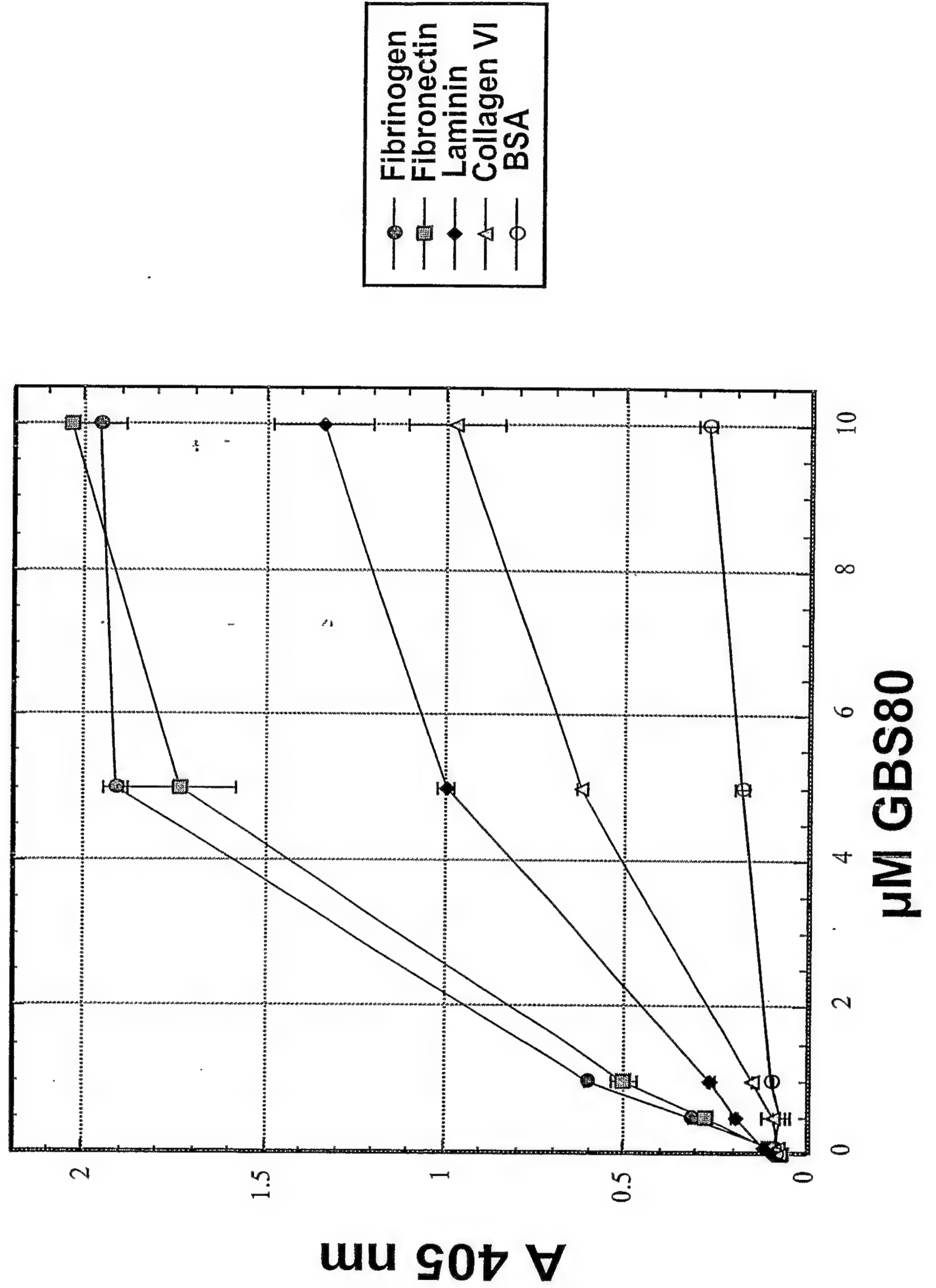


ME180 cervical carcinoma epithelial cells were infected with GBS 2603 wild type or 2603 D80 isogenic mutant. After 2h infection, non-adherent bacteria were washed off and infection prolonged for further 2h and 4h. In invasion experiments, after each time point followed a 2h antibiotic treatment. Cells were then lysed with 1% saponin and lysates plated on TSA plates.

Figure 204

GBS80 binds to ECM proteins

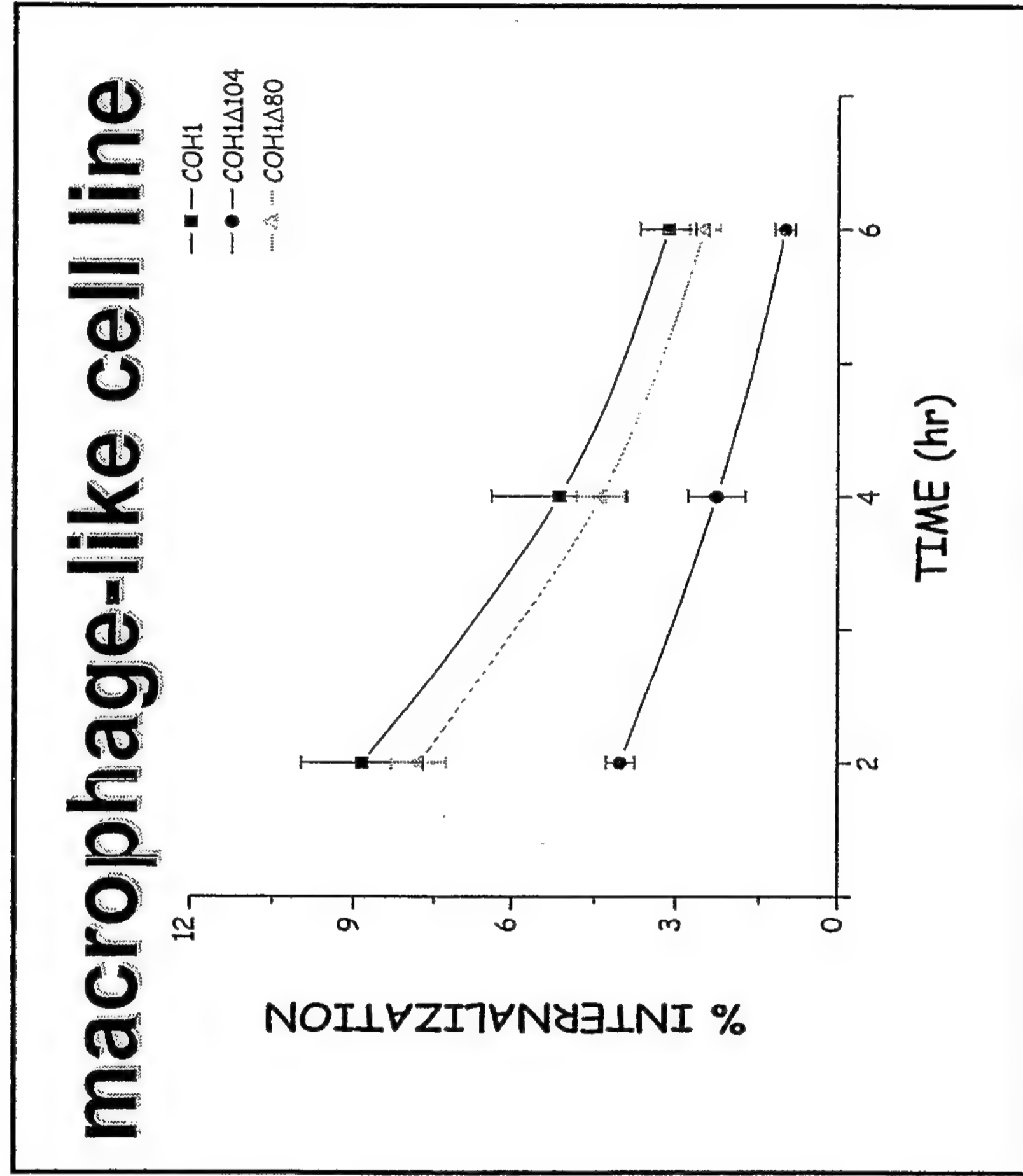
ELISA with purified ECM components and native GBS80 protein



443/487

Figure 205

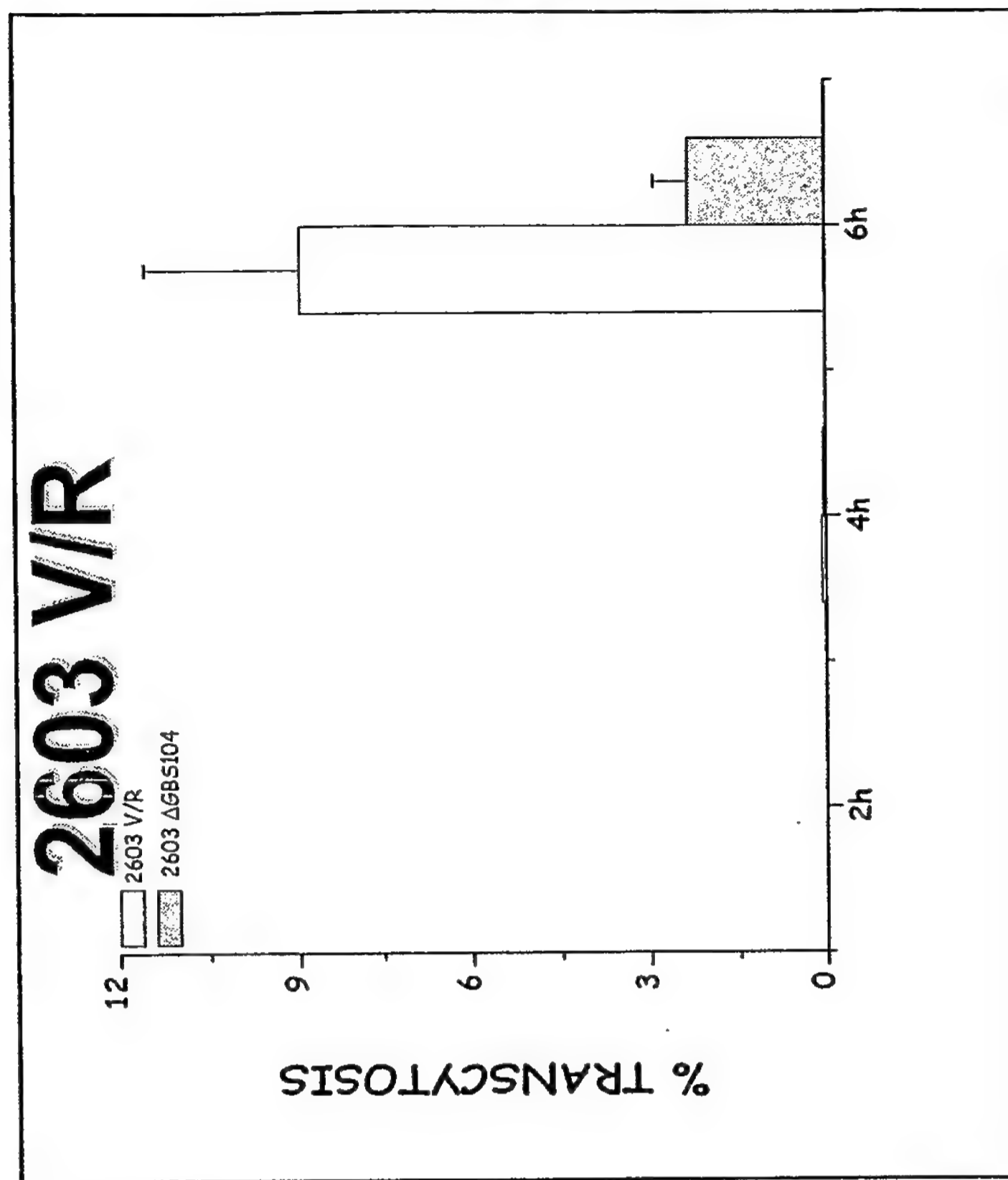
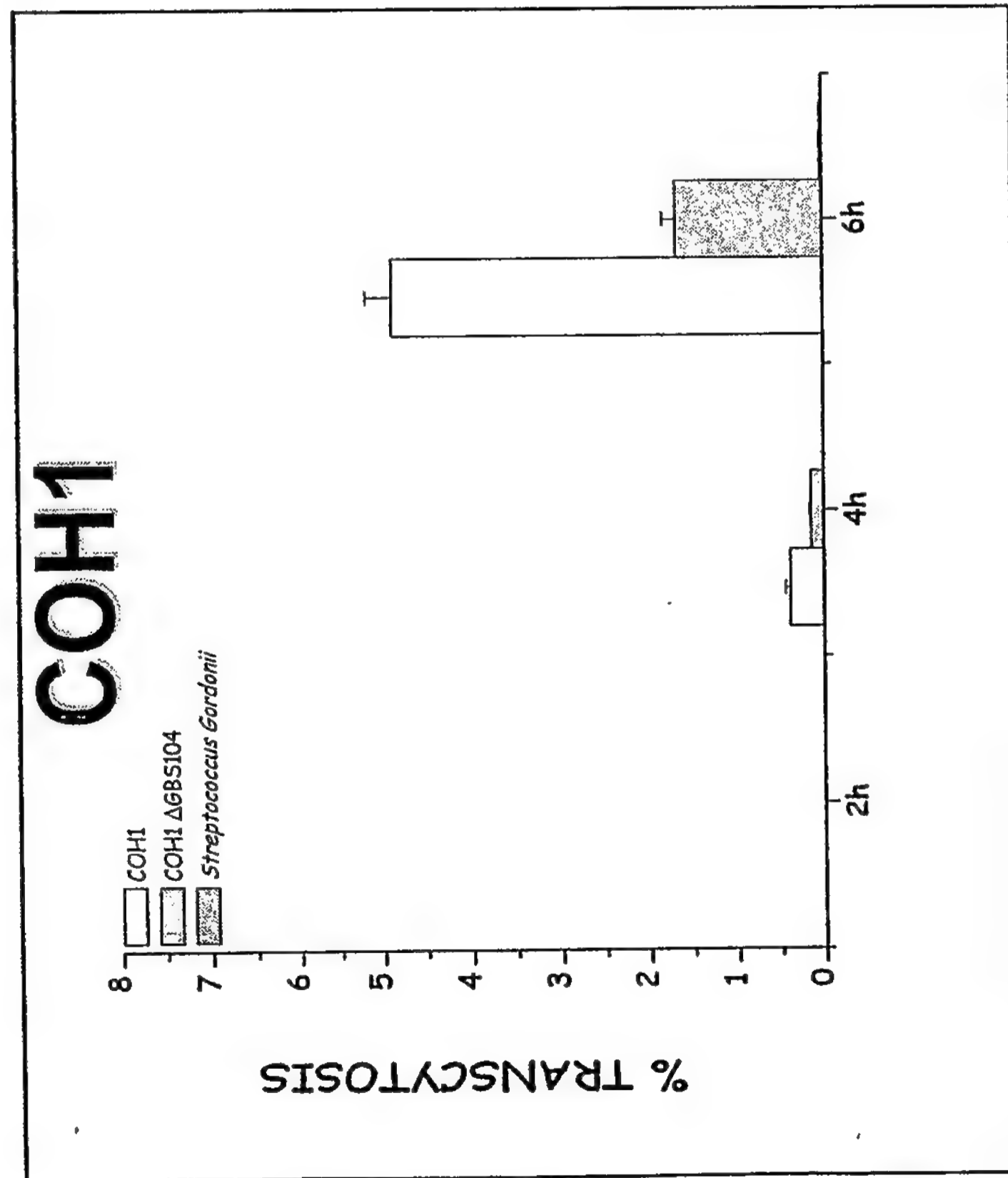
Deletion of GBS104 protein, but not GBS80, reduces the capacity of GBS to invade J774



J774 cells were infected with GBS COH1 wild type or COH1ΔGBS104/COH1ΔGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and intracellular bacteria recovered at 2h, 4h and 6h post-antibiotic treatment. At each time point cells were lysed with 0.25% Triton X-100 and

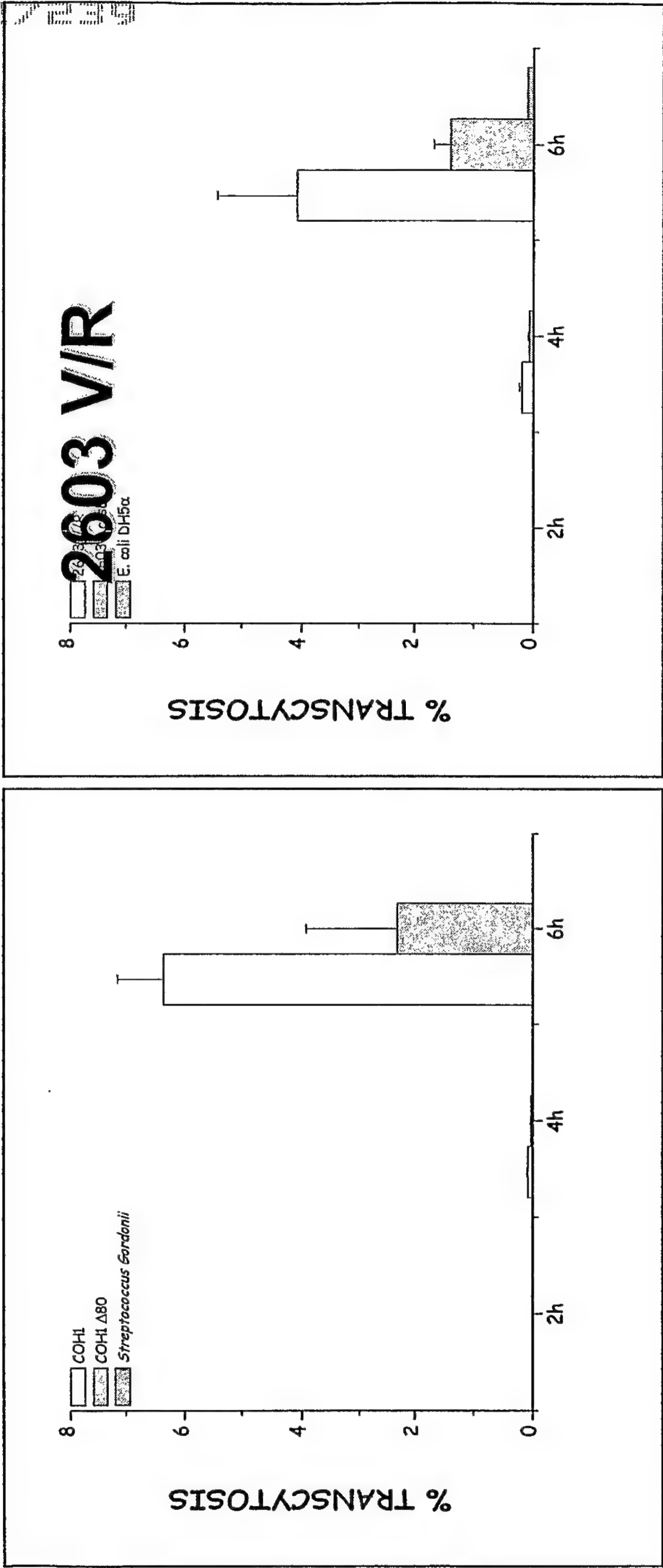
Figure 206

**GBS104 knockout mutant strain translocates
through an epithelial monolayer less efficiently than
the isogenic wild type**



GBS80 knockout mutant strain partially loses the ability to translocate through an epithelial monolayer

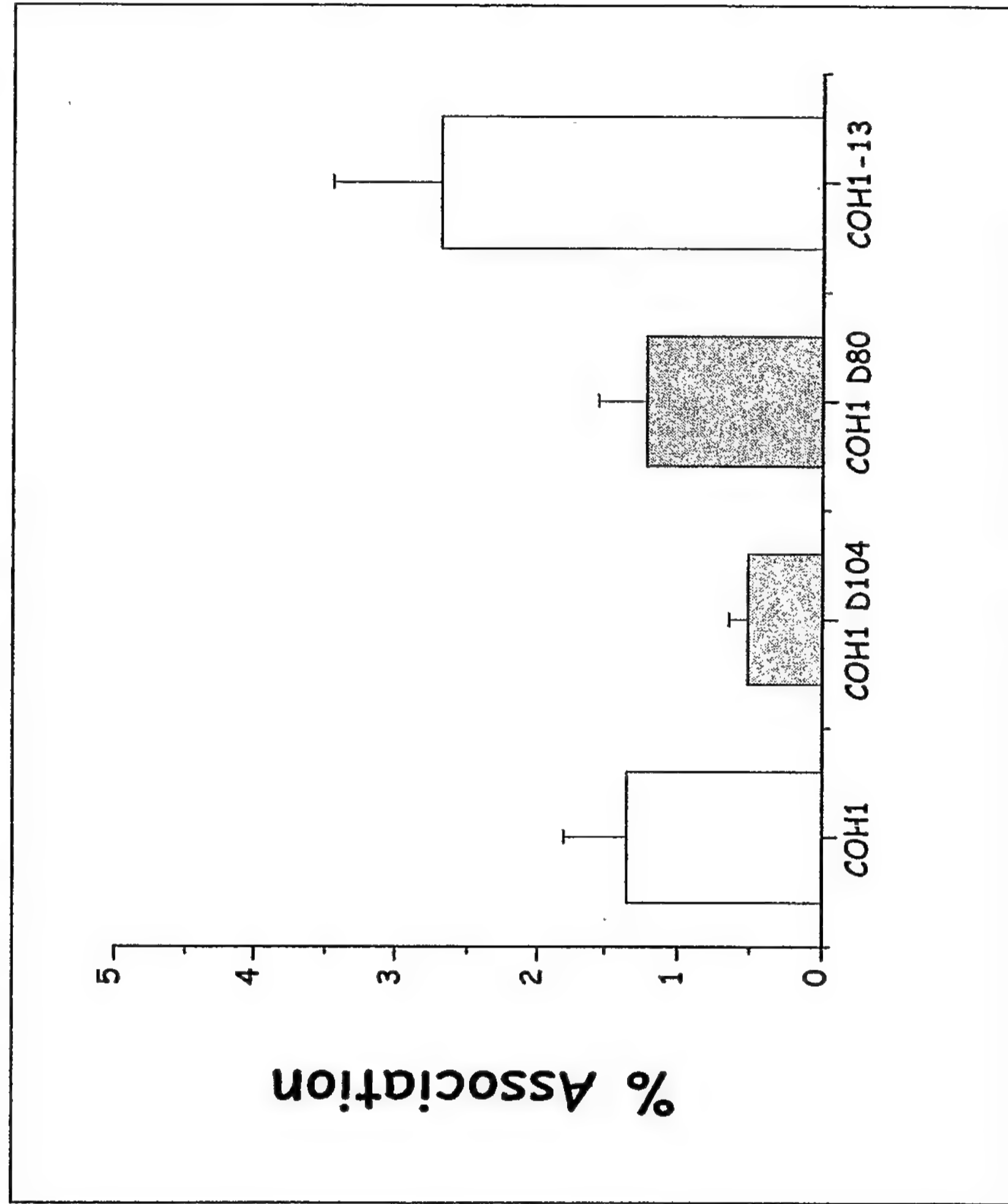
Figure 207



Epithelial cells monolayers were inoculated with each bacterium in the apical chamber of a transwell system for 2h and then non-adherent bacteria washed off. Infection was prolonged for further 2h and 4h. Samples were taken from the media of the basolateral side and the number of colony forming units measured. Transepithelial electrical resistance measured prior and after infection gave comparable values, indicating the maintenance of the integrity of the monolayer.

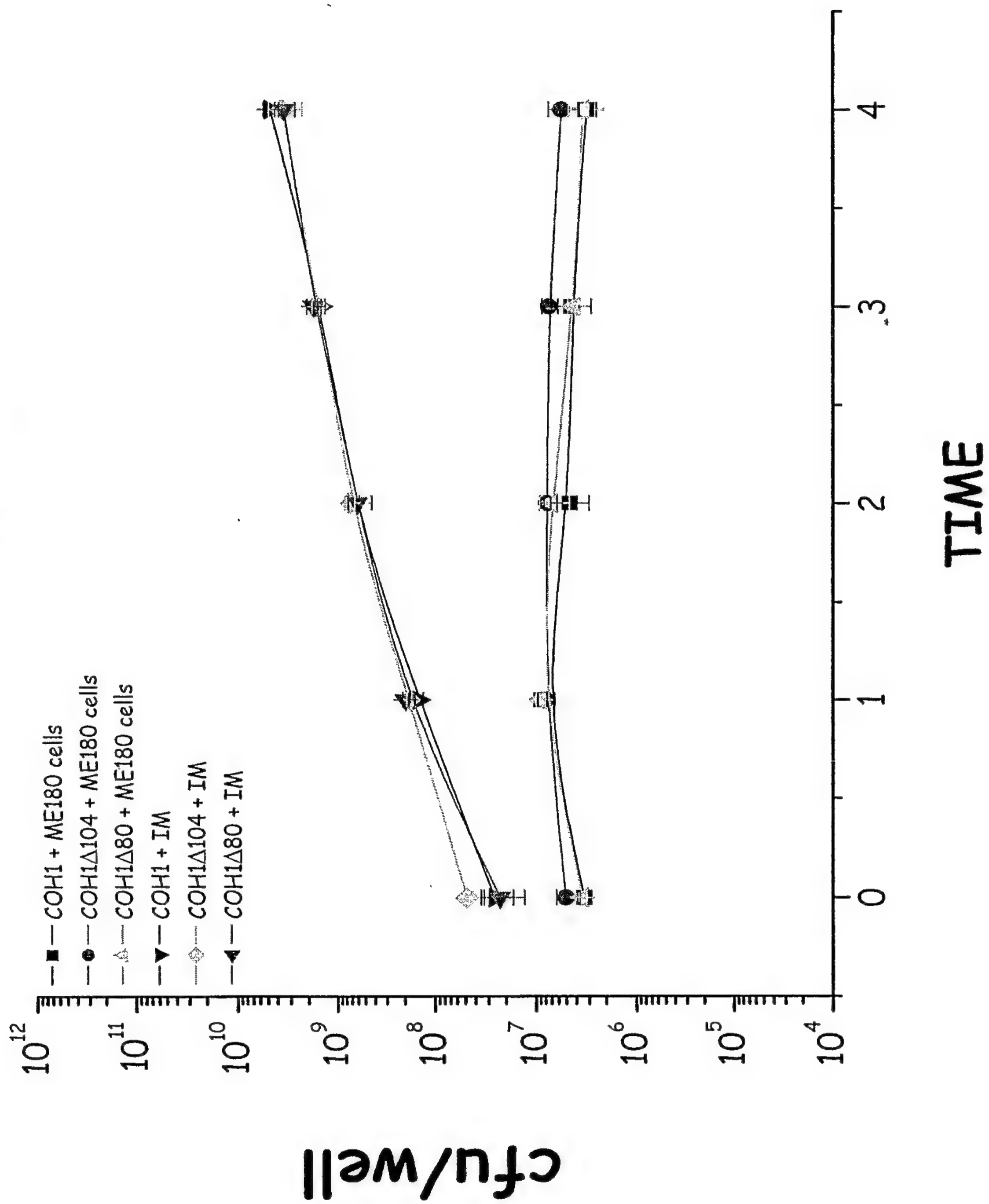
Figure 208

GBS adherence to HUVEC endothelial cells



HUVEC cells were infected with GBS COH1 wild type or COH1DGBS104/COH1DGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and cells lysed with 1% saponin and lysates plated on TSA plates.

Figure 209

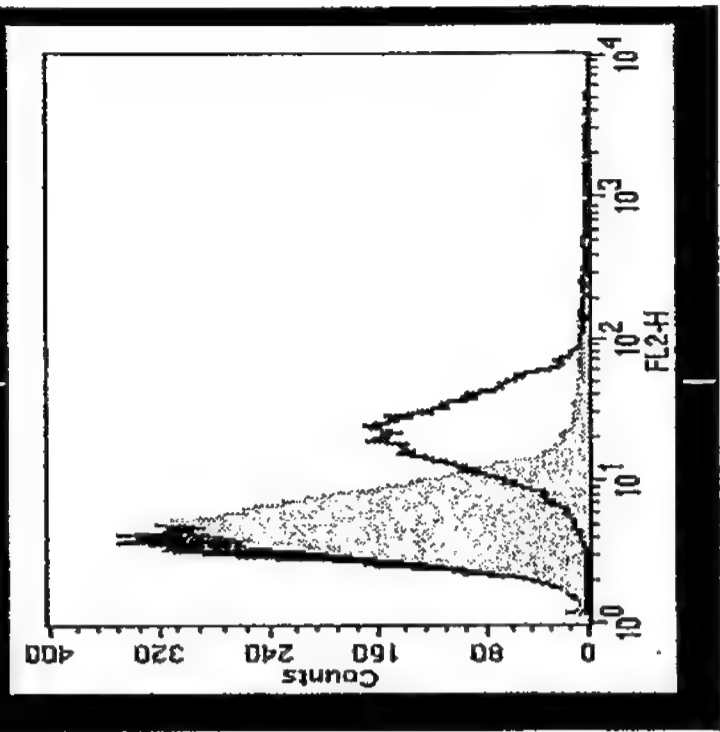
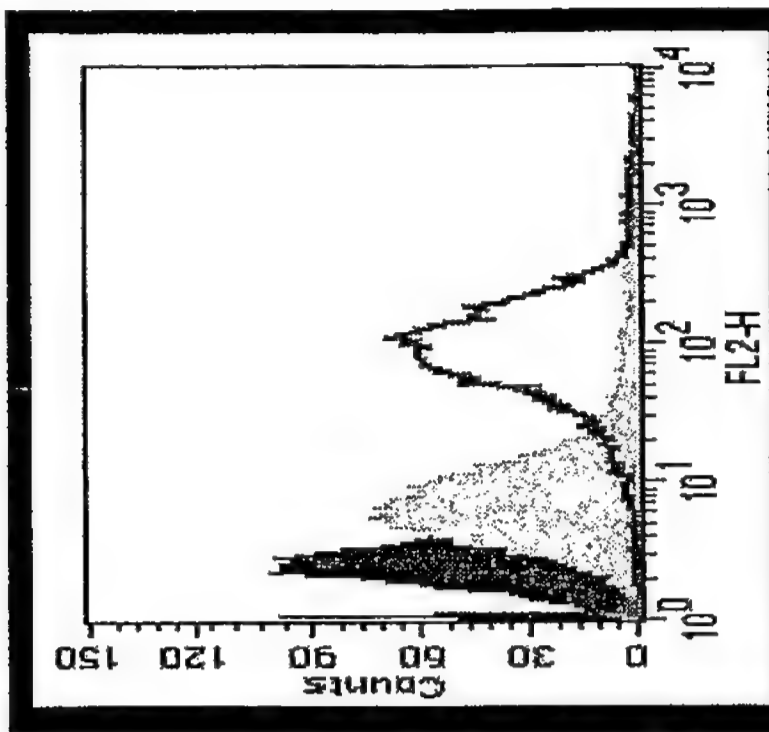


PCT/US2005/027239

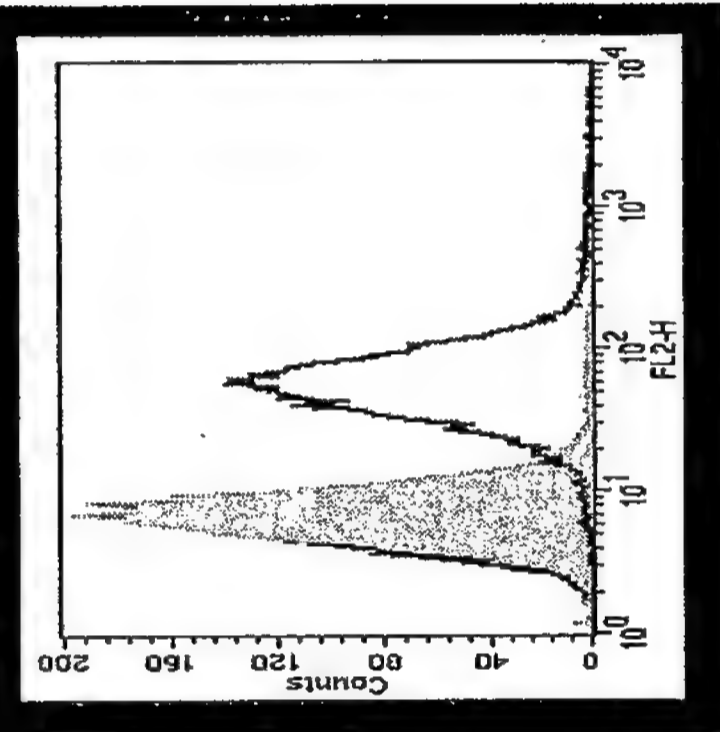
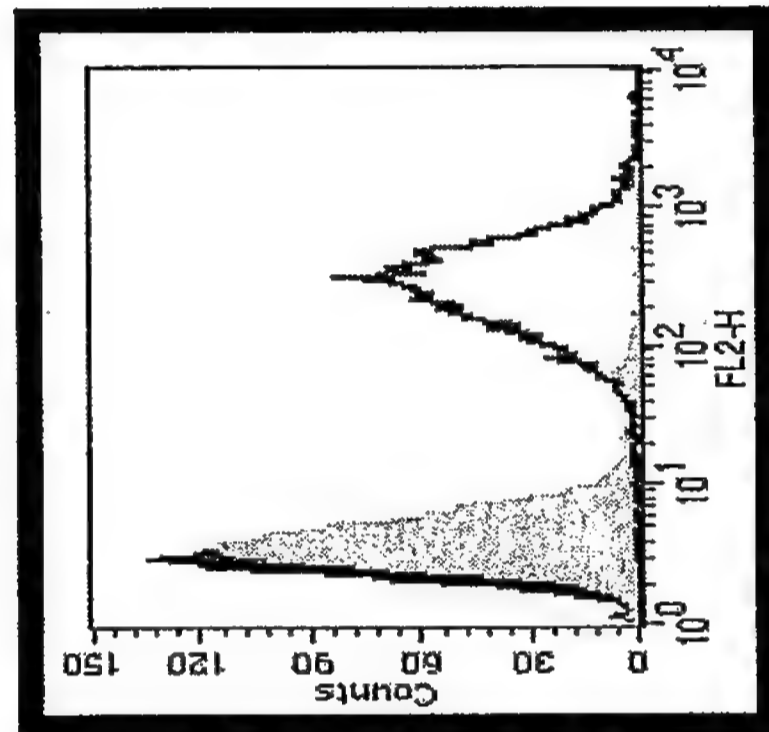
Figure 210

Binding of recombinant GBS104 protein to epithelial cells

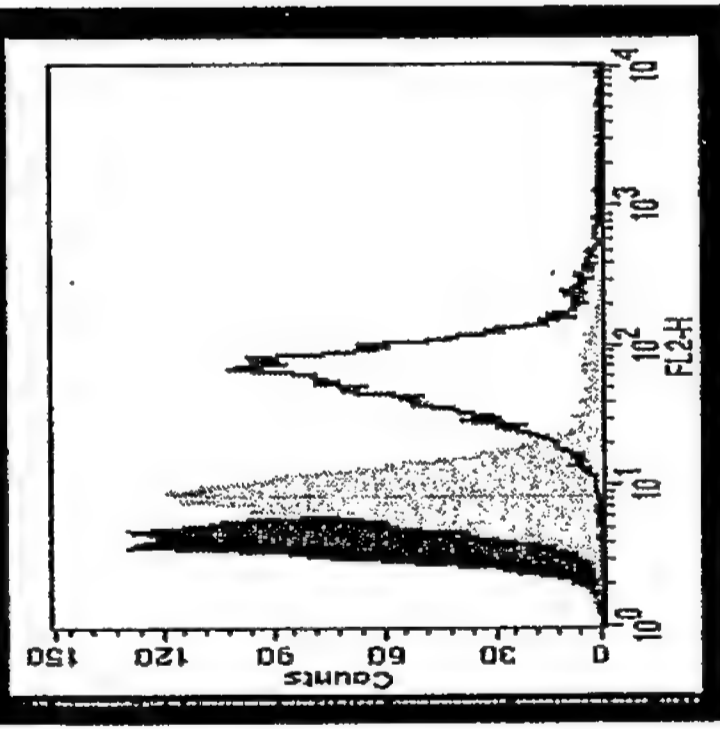
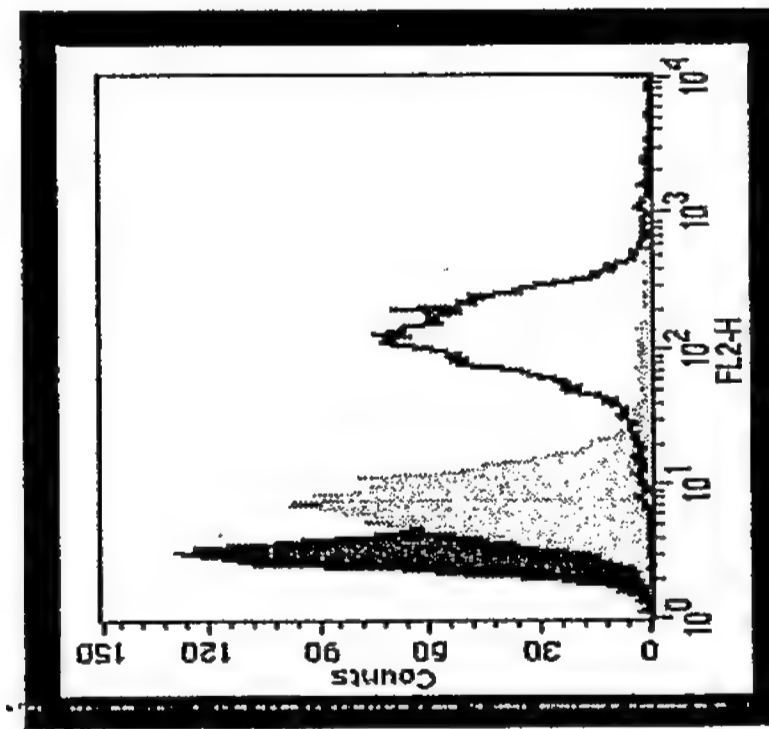
Caco2
Intestinal
Human



A549
Lung
Human



ME180
Cervical
Human

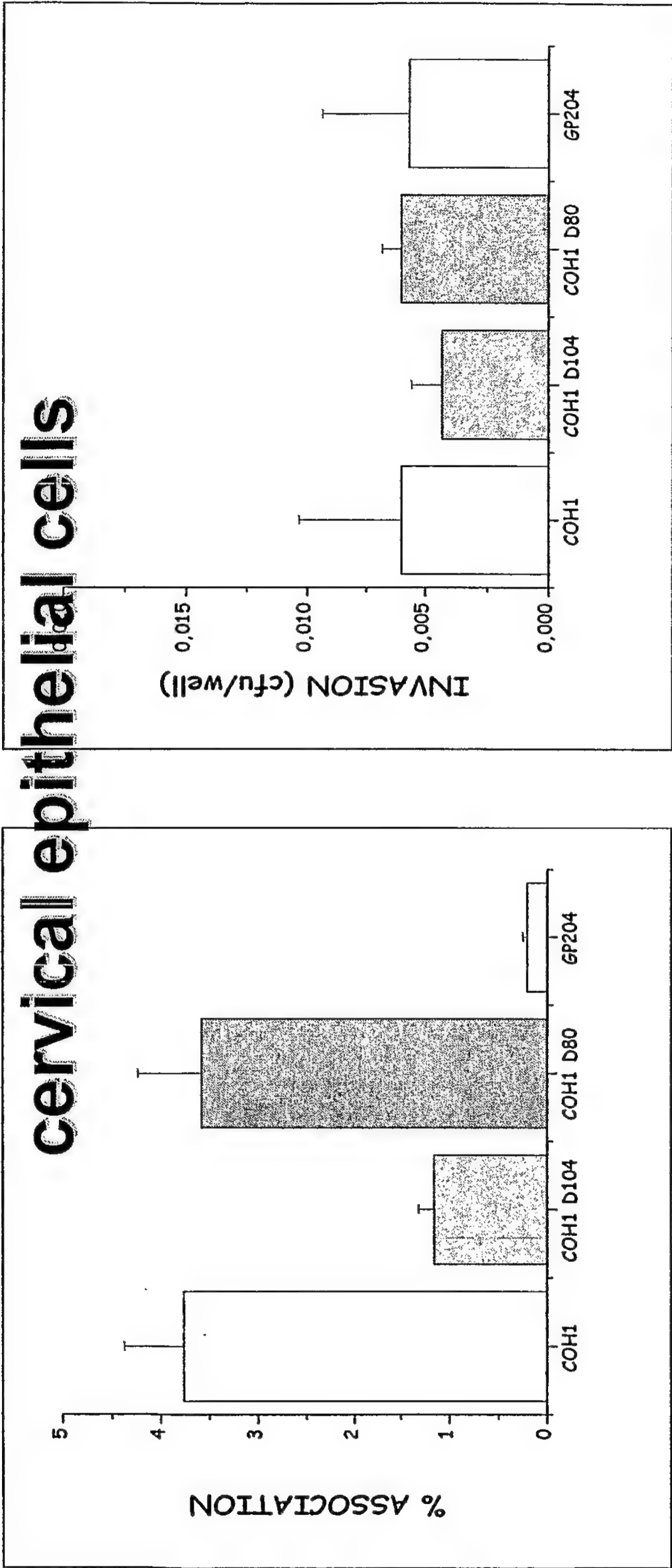


Whole
length
protein
830 AA

C-term
portion
359 AA

Figure 211

Deletion of GBS104 protein in the GBS strain COH1 reduces the ability of GBS to adhere to ME180

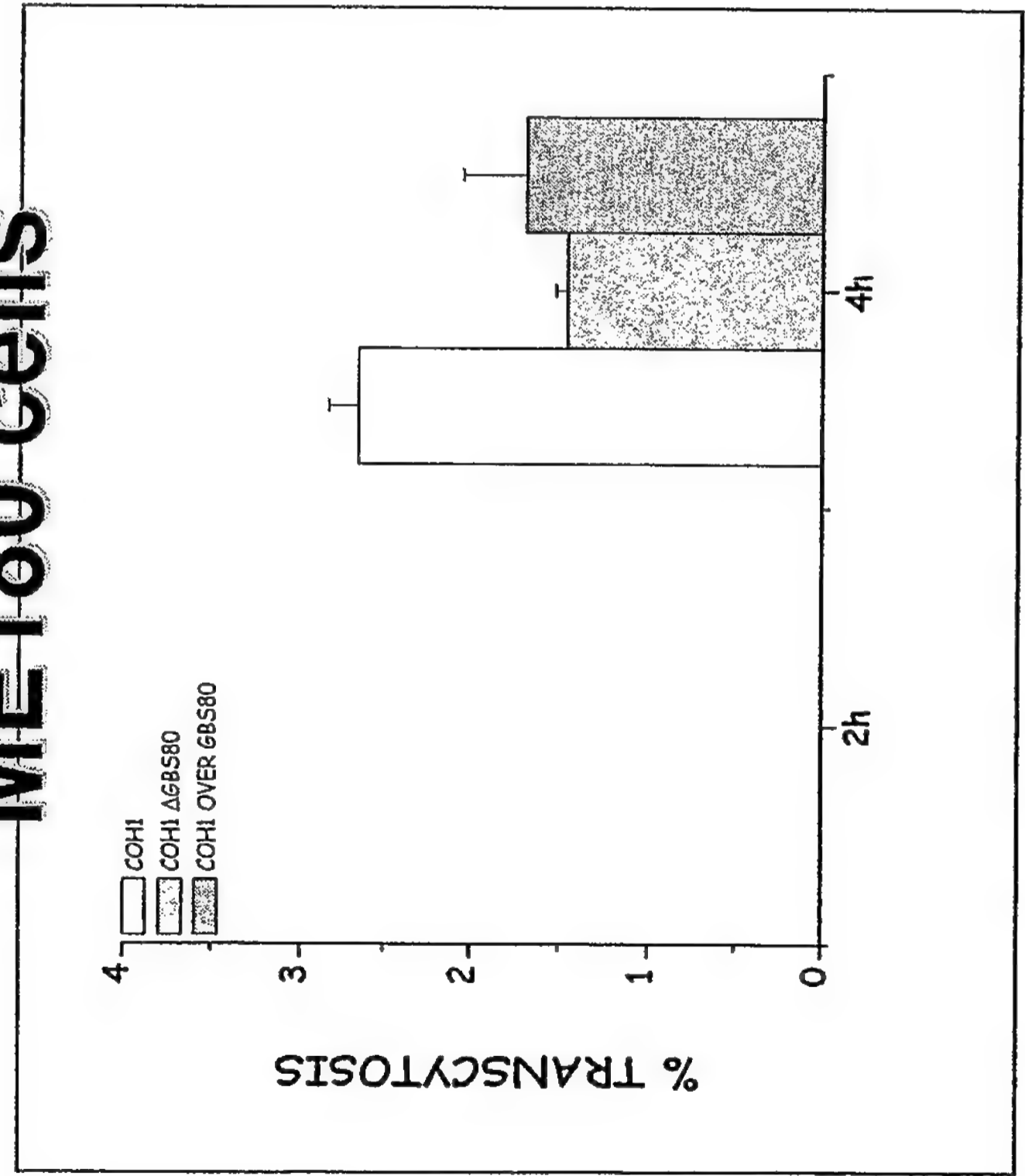


ME180 cervical carcinoma epithelial cells were infected with GBS COH1 wild type or COH1DGBS104/ COH1DGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and cells lysed with 1% saponin and liveatae nlated on TSA nlateae

Figure 212

COH1 overexpressing GBS80 protein has an impaired capacity to translocate through an epithelial monolayer

ME180 cells



Caco2 cells

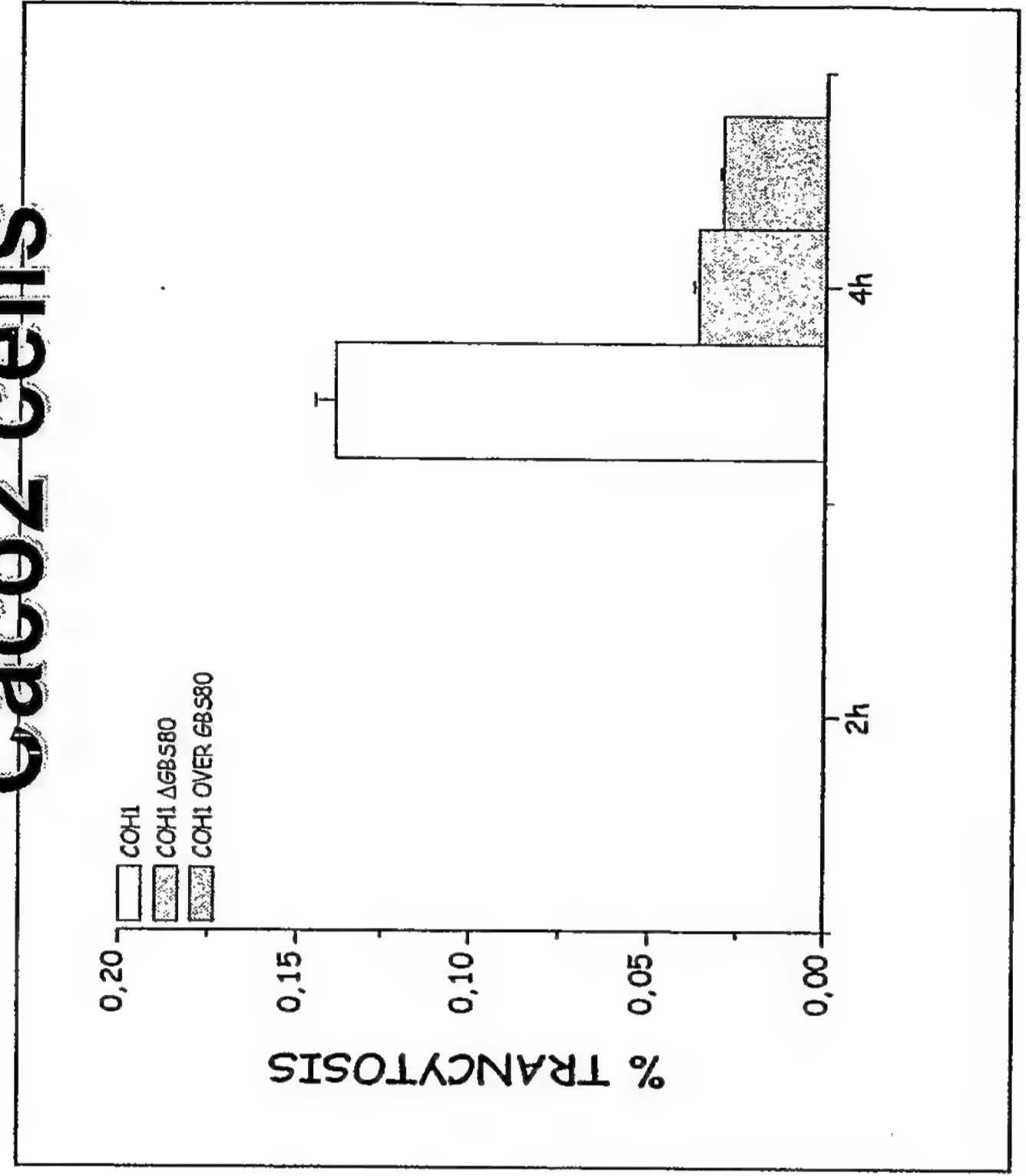
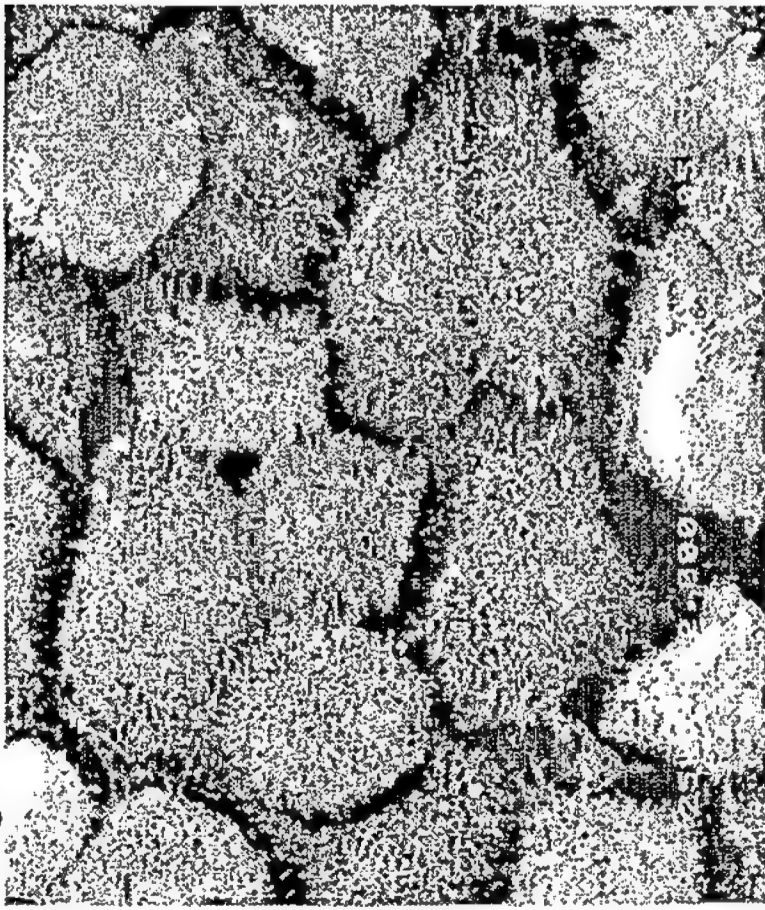


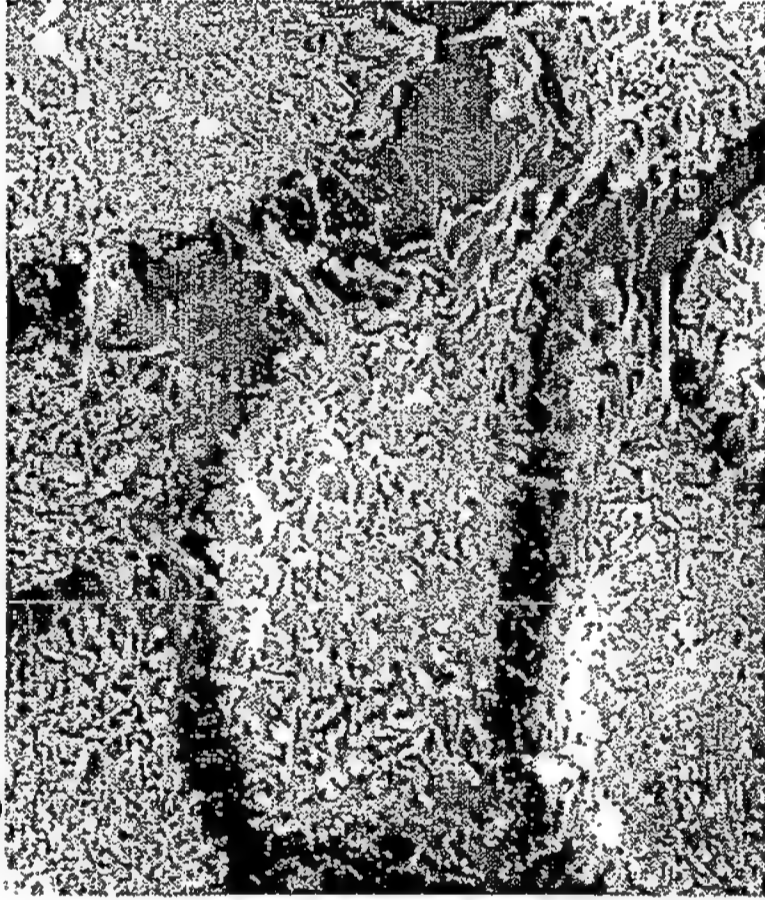
Figure 213

Magnification x2000

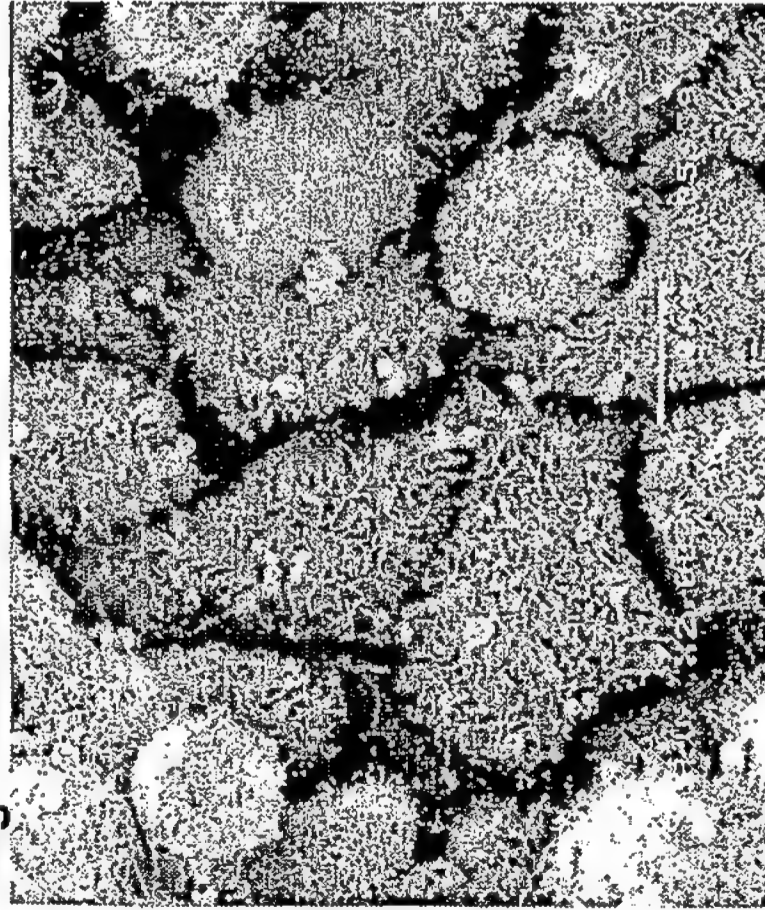


Non-infected ME180 cells
(SEM)

Magnification x3500

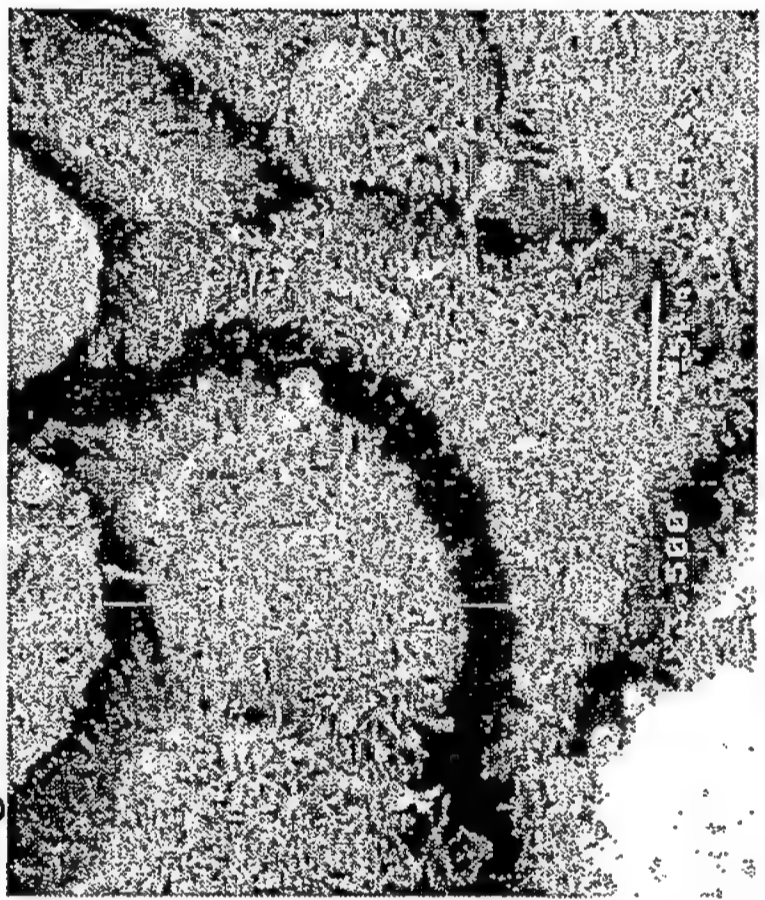


Magnification x2000

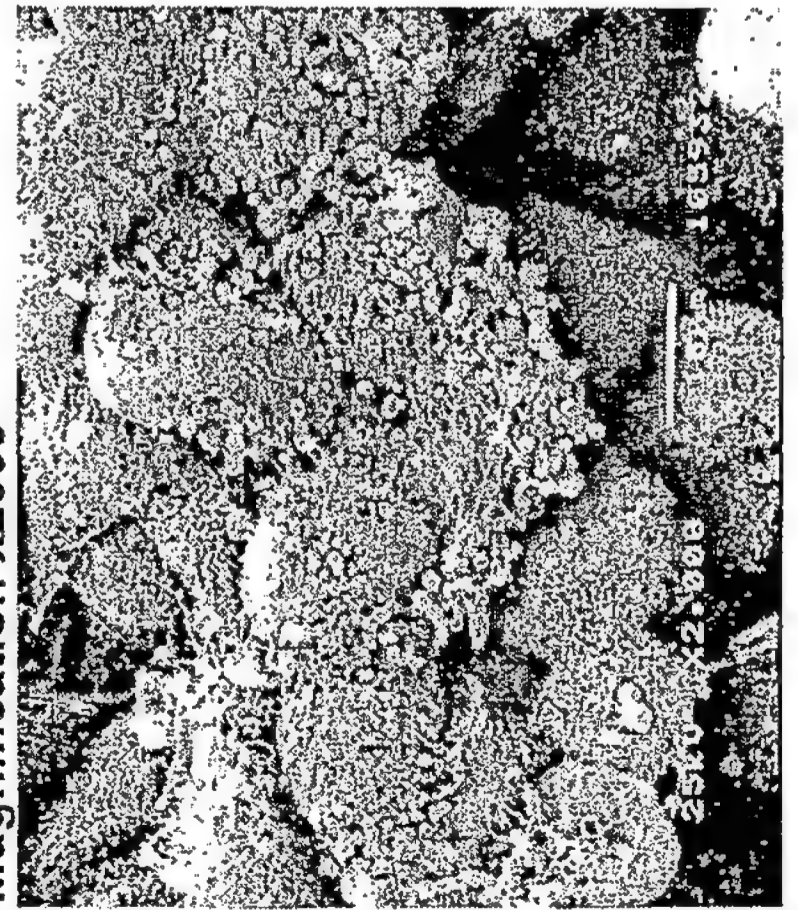


ME180 cells infected with COH1 strain
(SEM)

Magnification x3500



Magnification x2000



ME180 cells infected with
COH1 strain
overexpressing GBS80
(SEM)

Magnification x3500



Figure 214

OH1 infection of ME180 cells

F-actin Blue

α -serotype III capsule Red

α -GBS80 Green

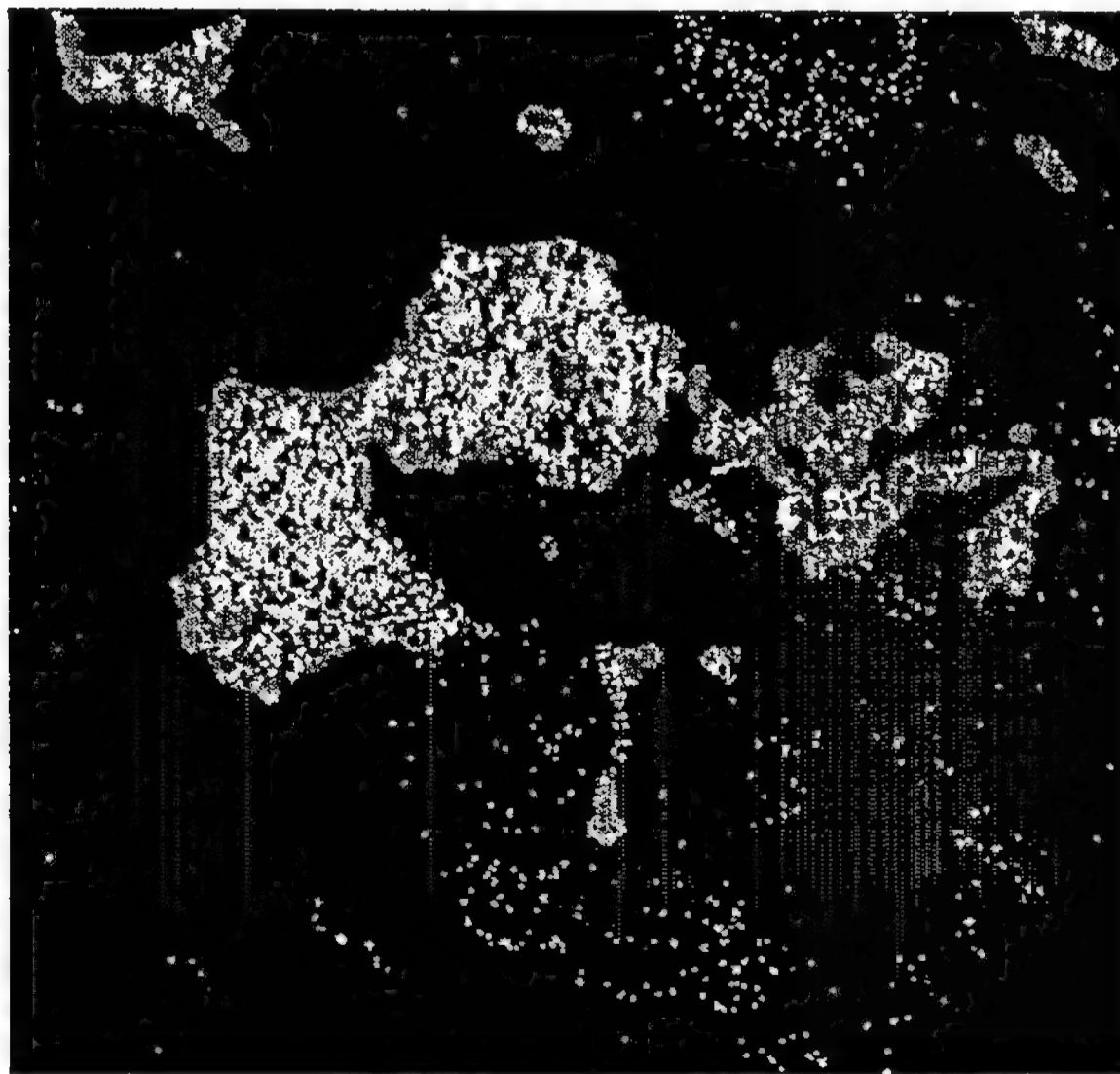
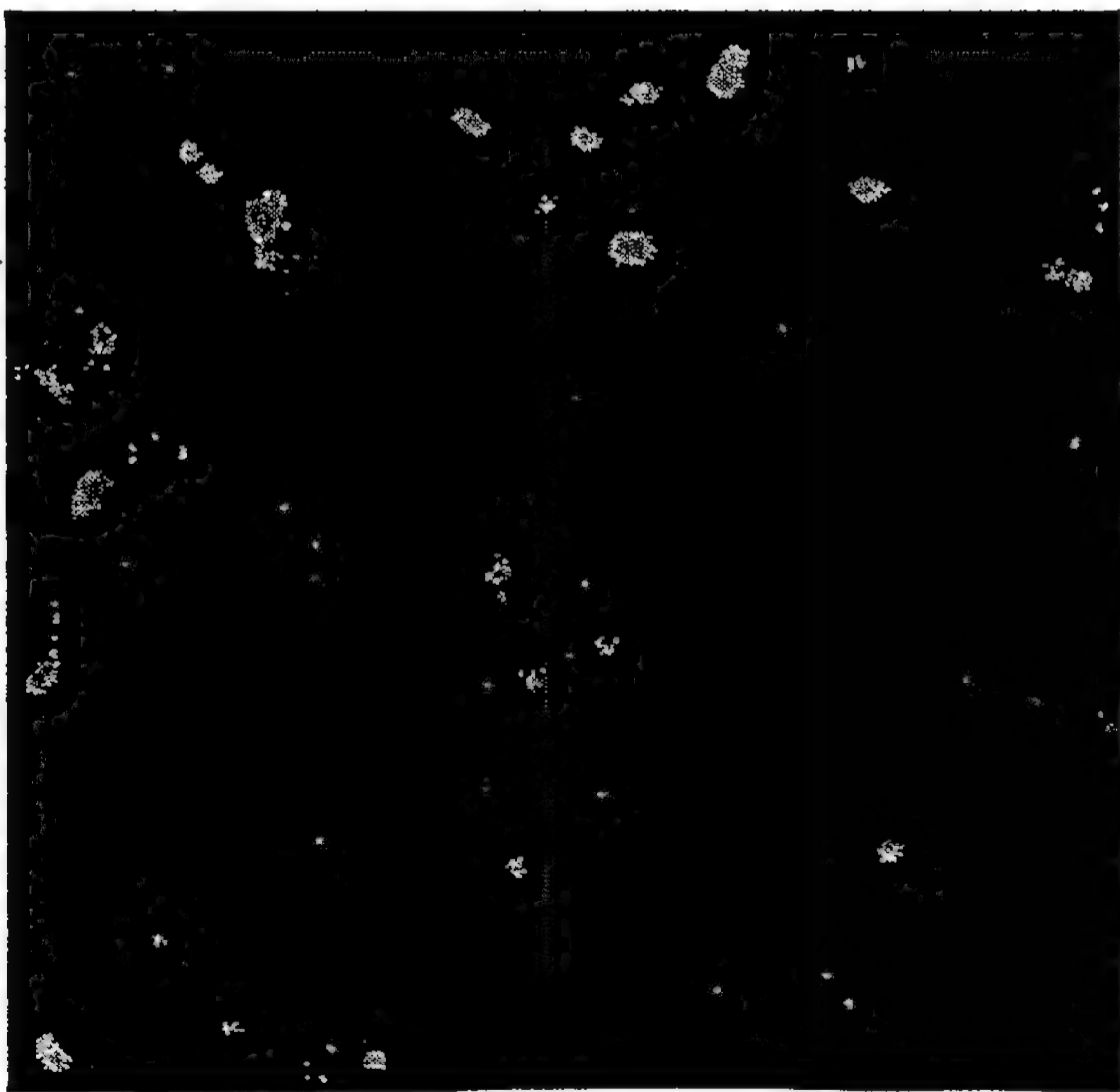
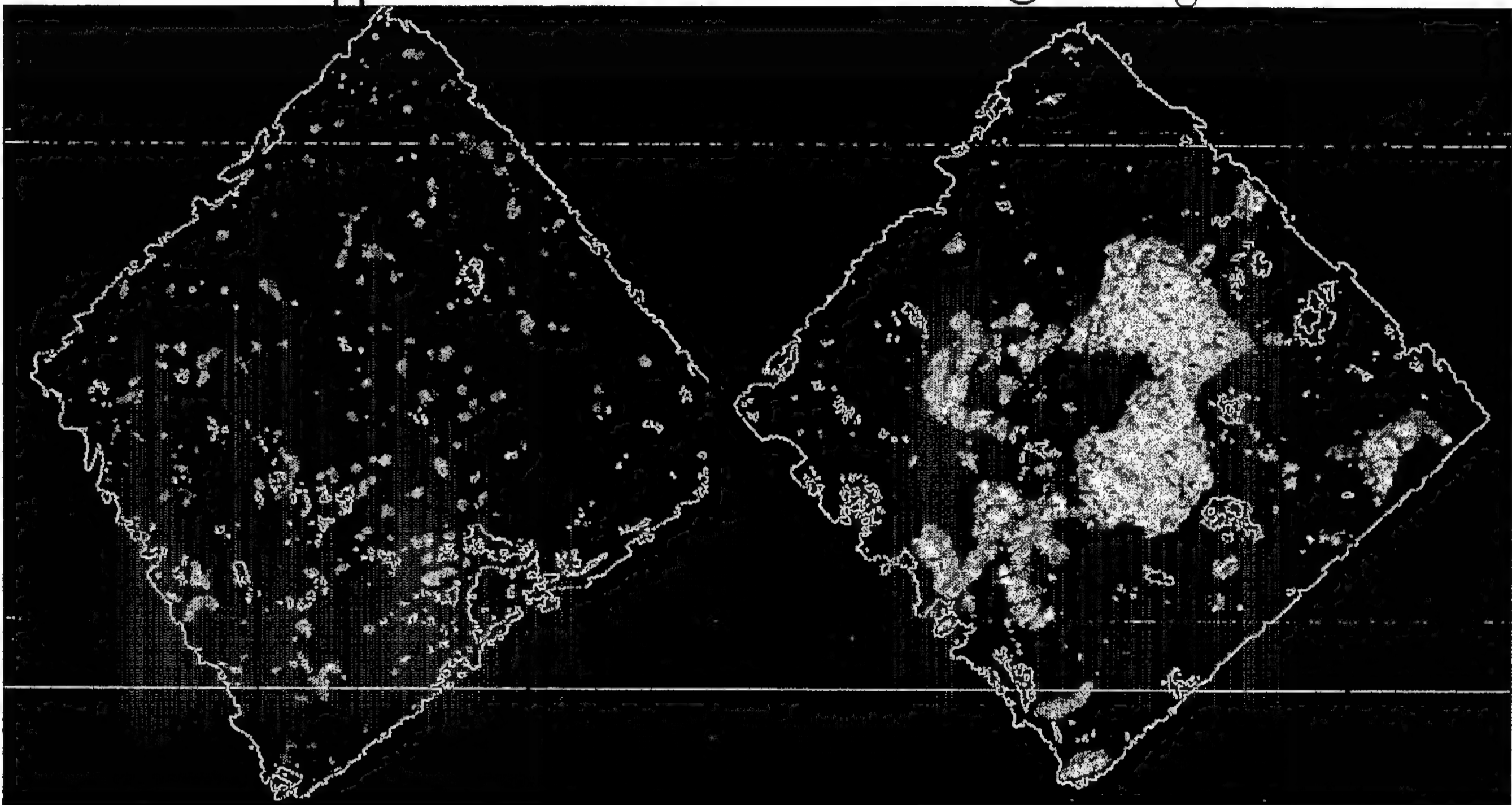
OH1 overexpressing GBS80

infection of ME180 cells

F-actin Blue

α -serotype III capsule Red

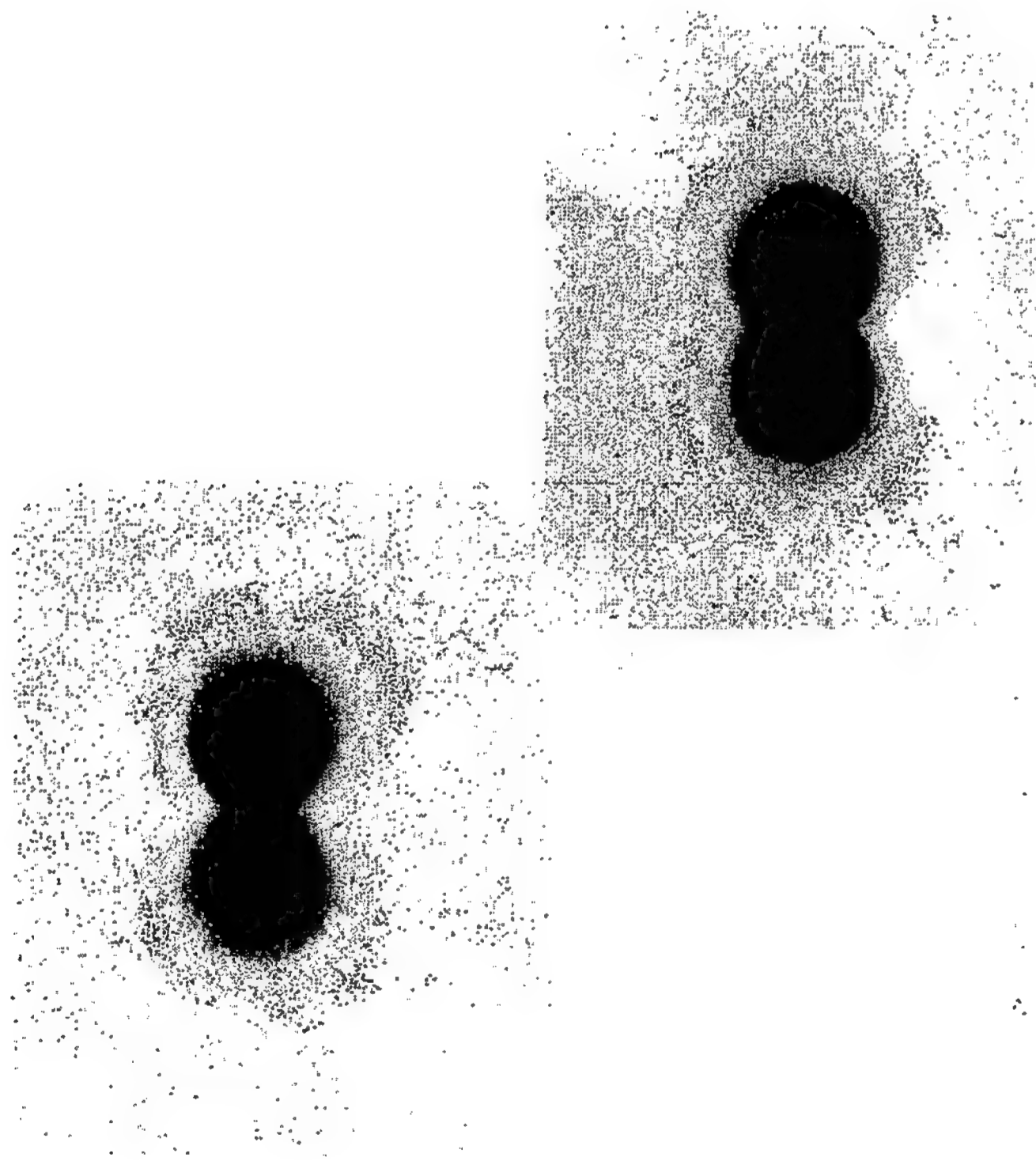
α -GBS80 Green



453/487

Figure 215

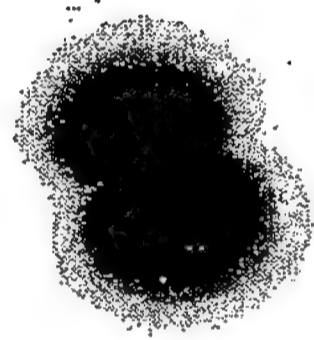
515 WT



515 Δ 59p59



515 Δ 59



α 59

α 59

Figure 216

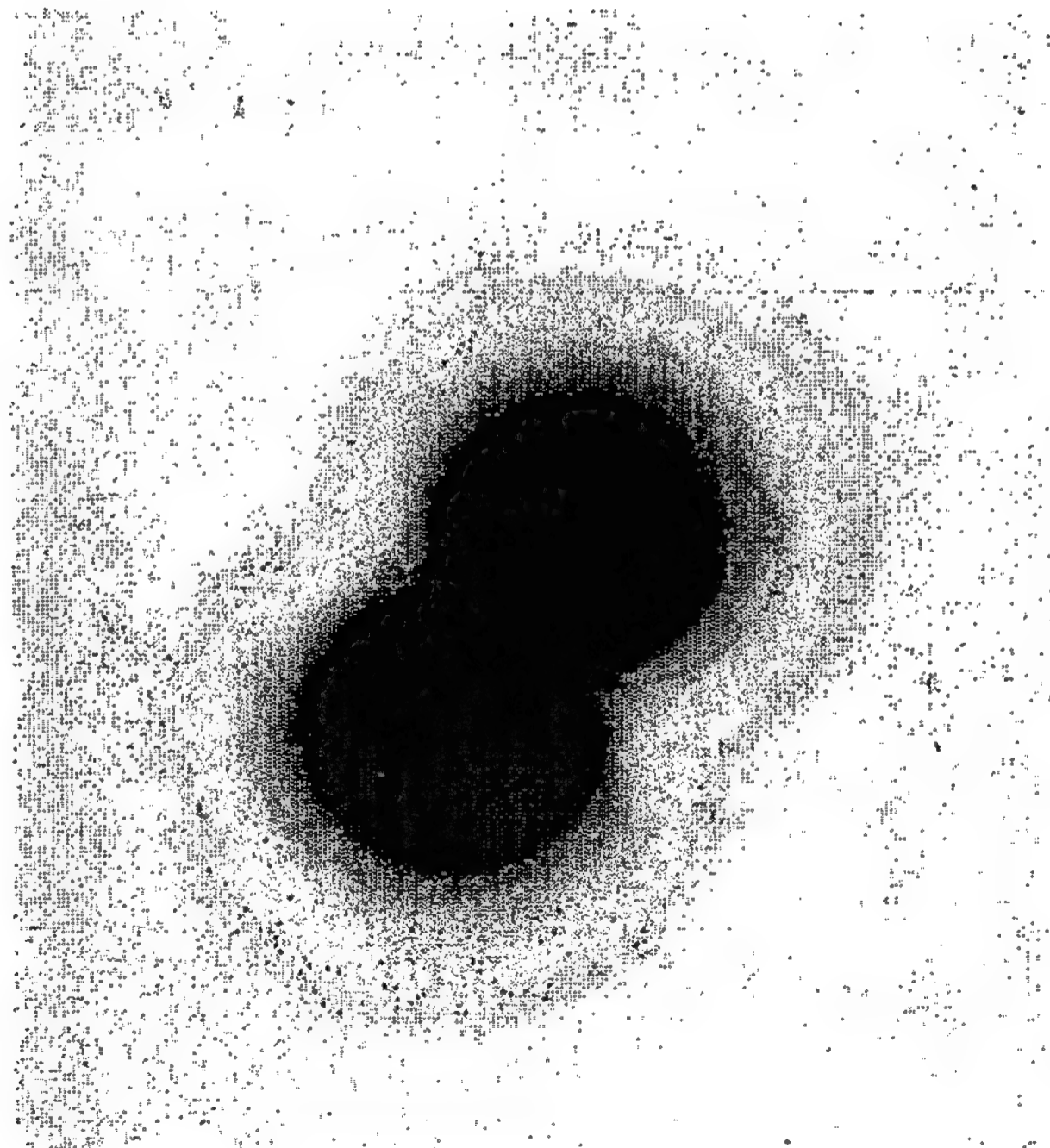
WO 2006/078318

PCT/US05/27239

454/487

PCT/US2005/027239

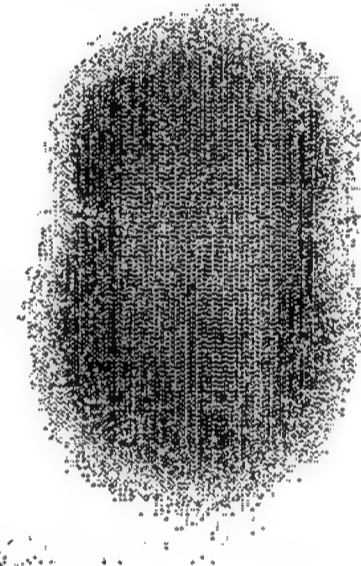
515 Δ 67p67



515 WT

α 67

515 Δ 67



α 67

Figure 217

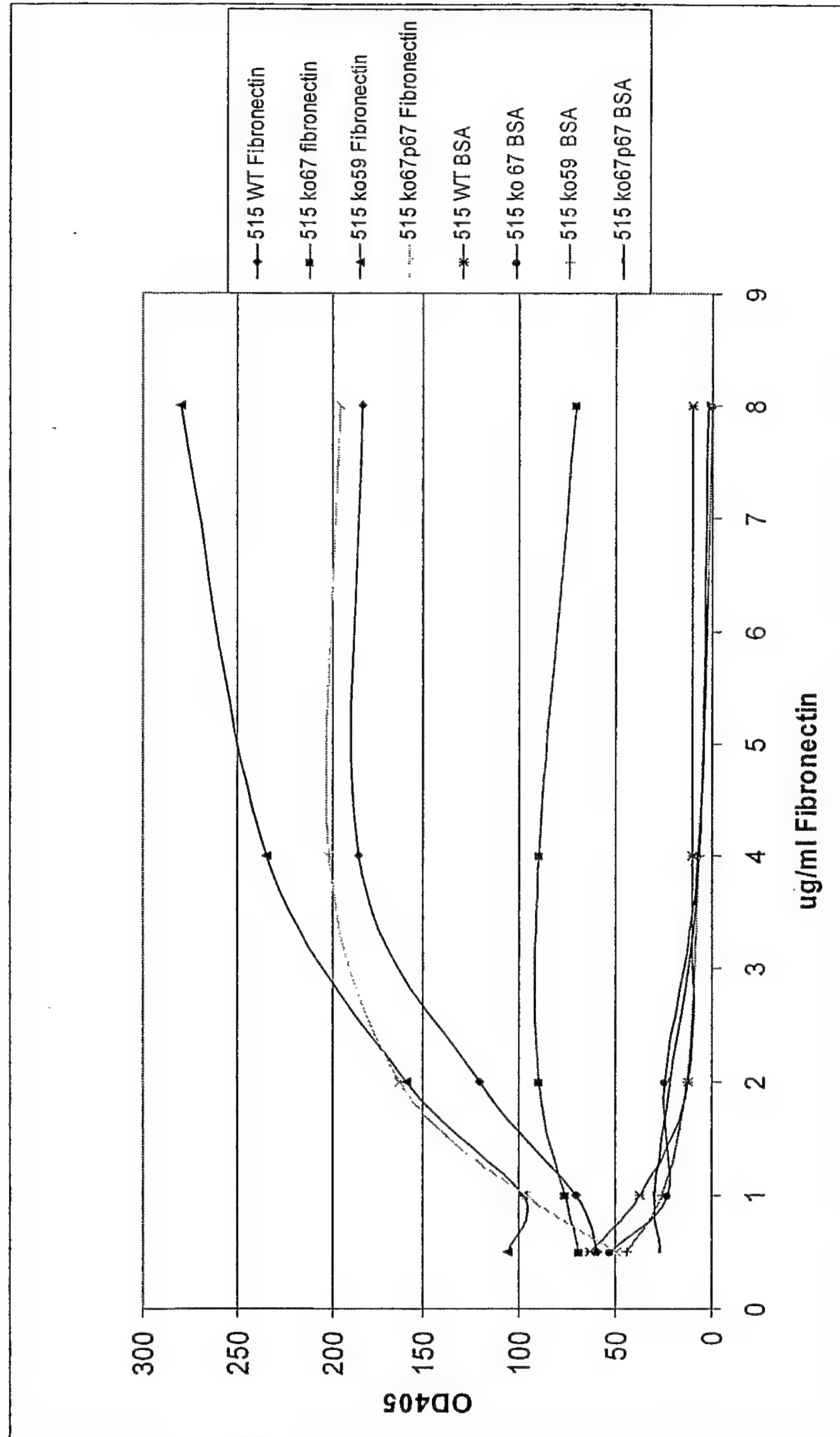
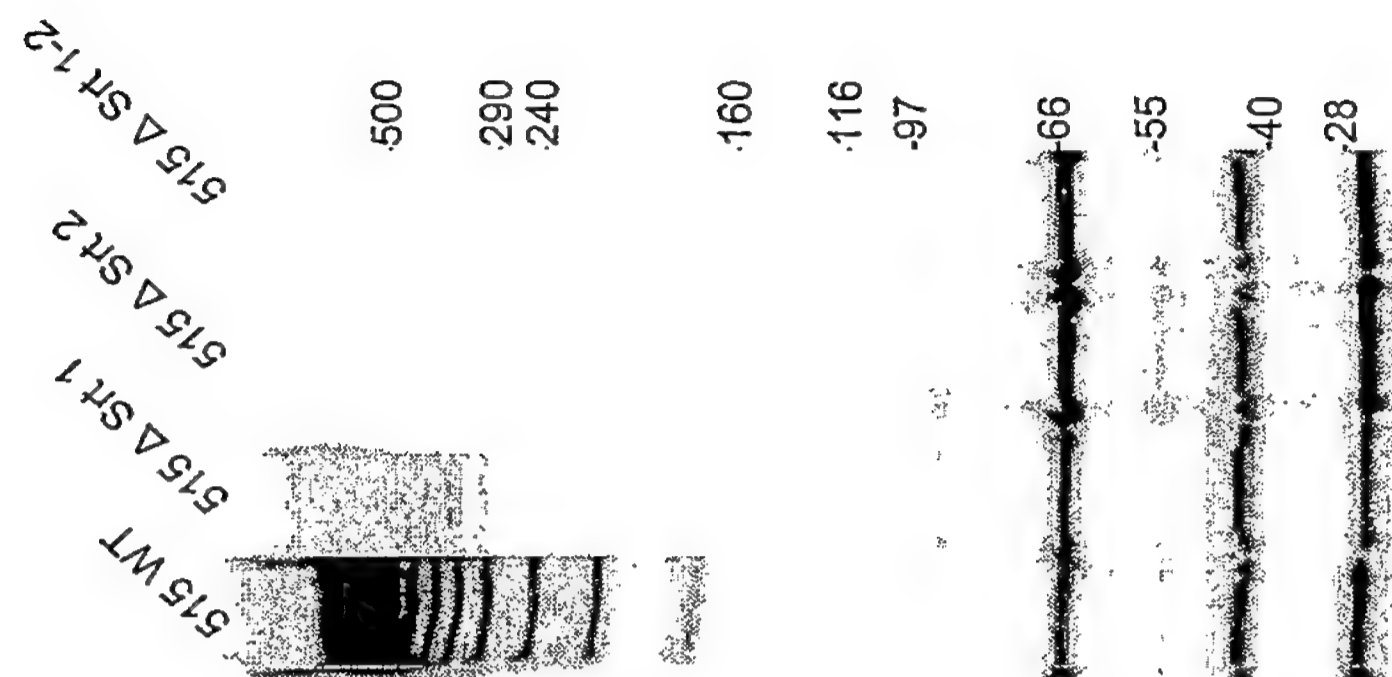
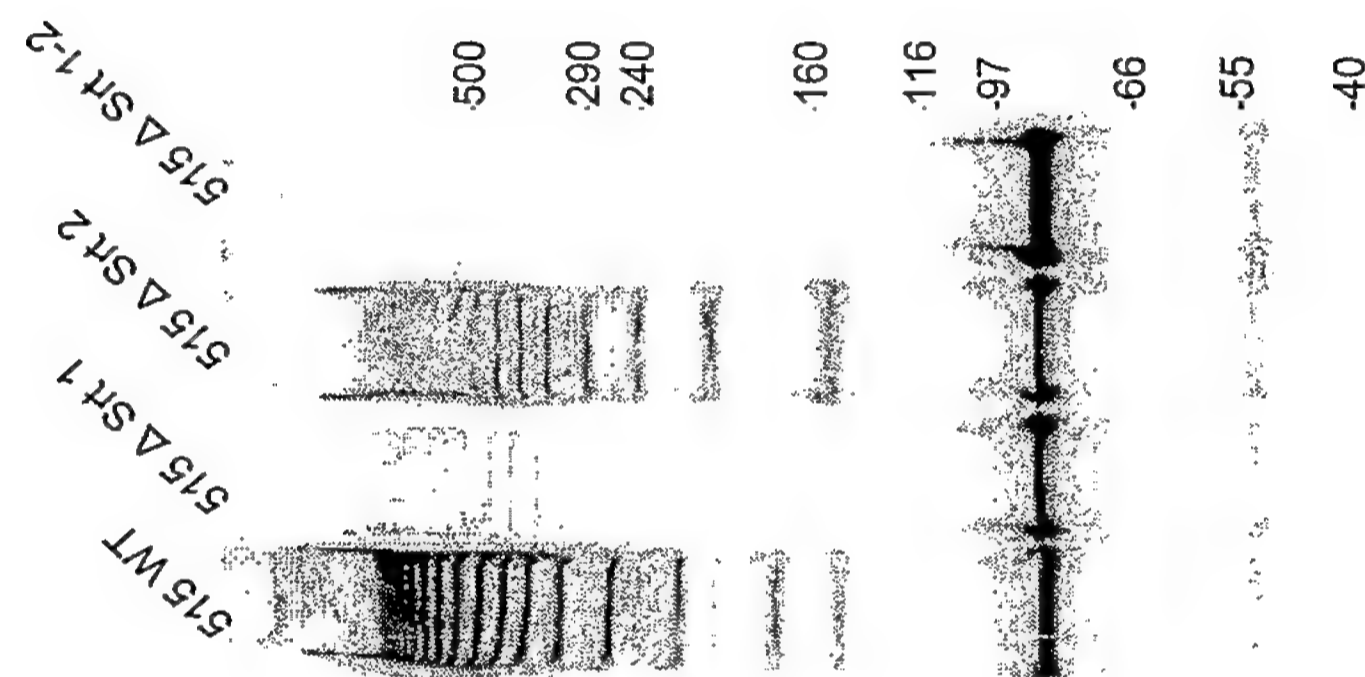
GBS 67 binds to fibronectin

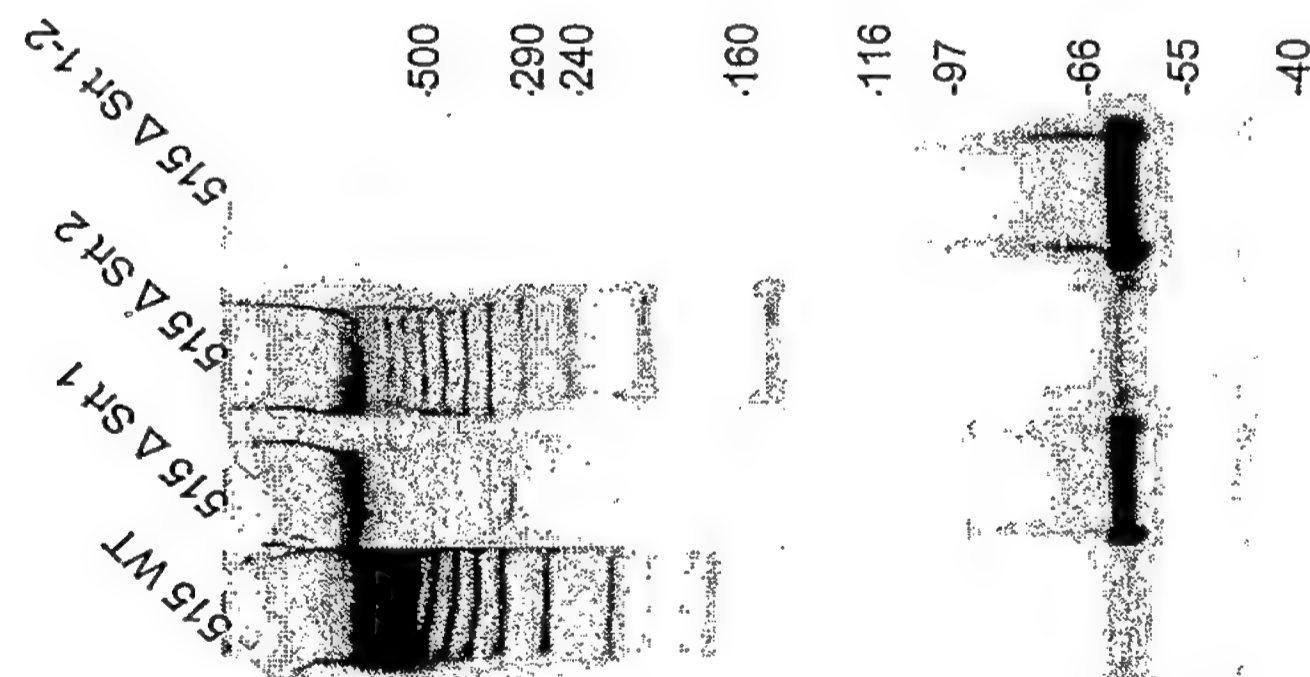
Figure 218



α-GBS 150



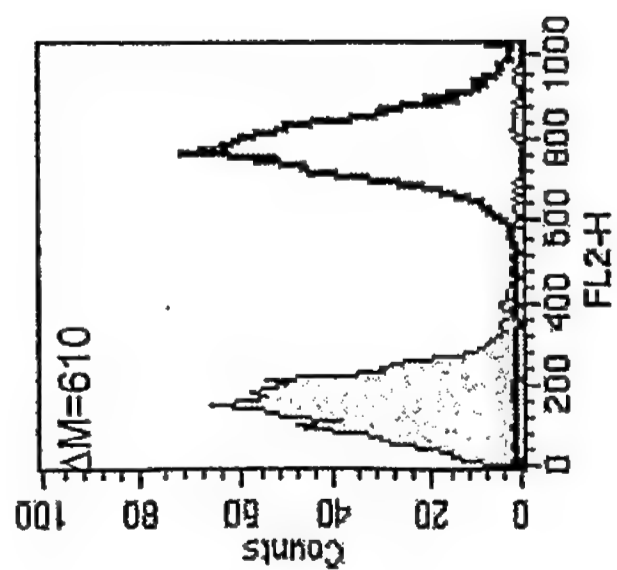
α-GBS 67



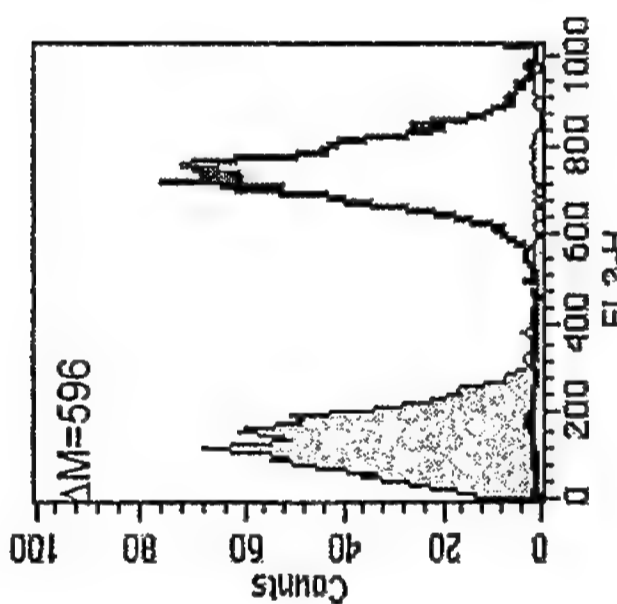
α-GBS 59

Figure 219

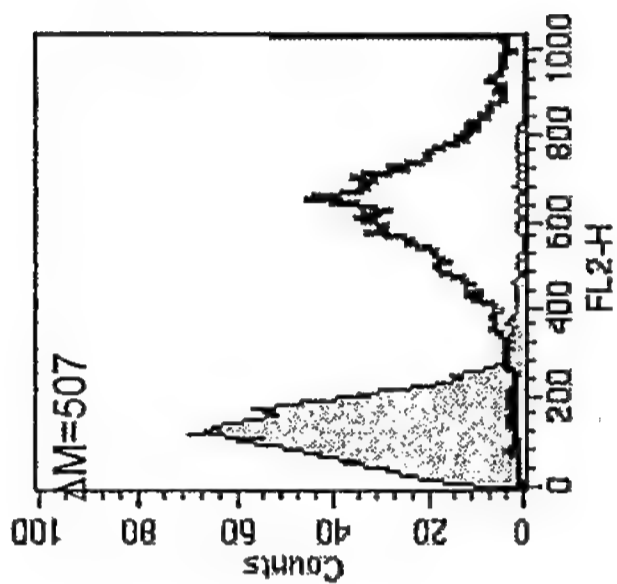
515 WT



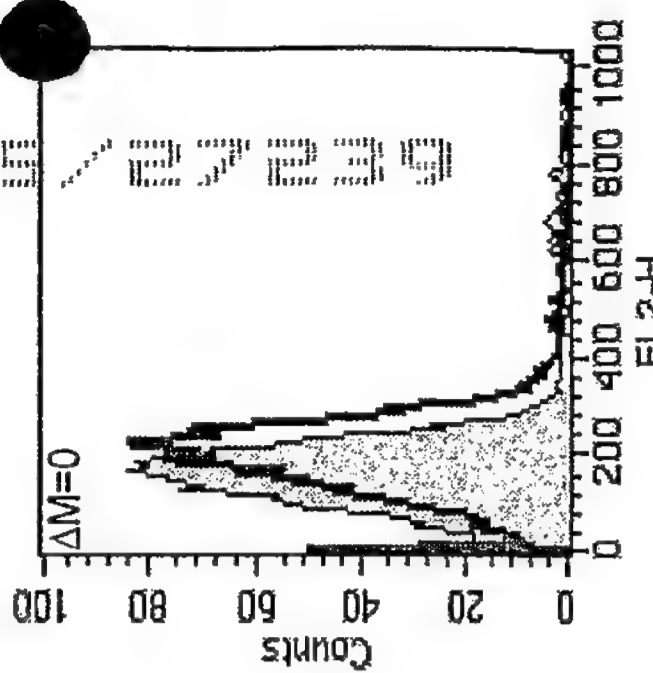
515 Δ Srt 1



515 Δ Srt 2

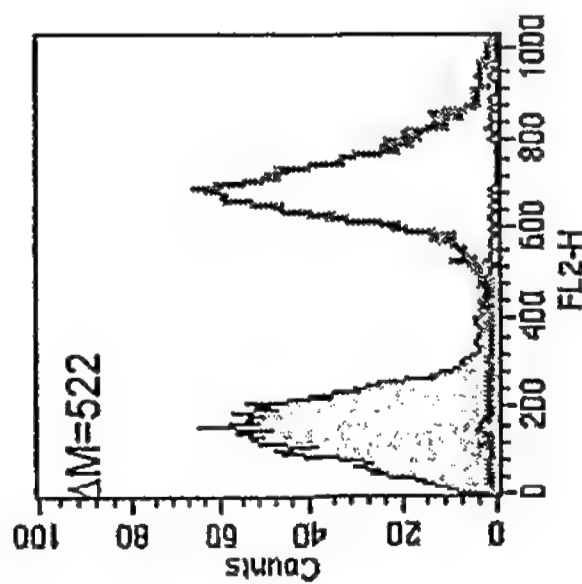


515 Δ Srt 1 2



α59

457/487



α67

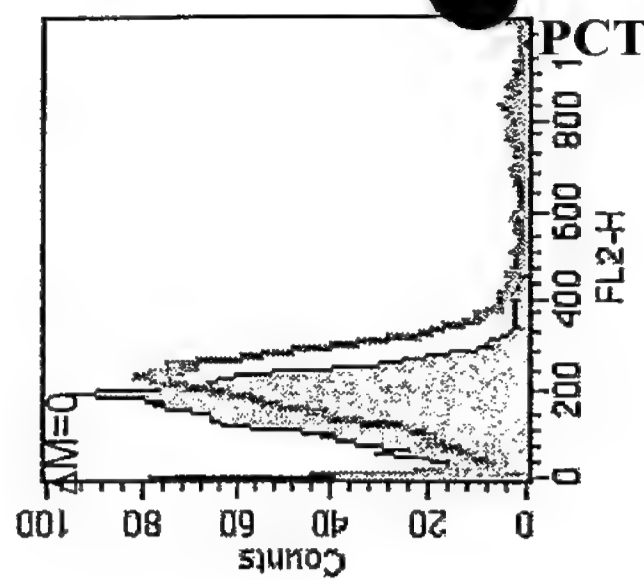
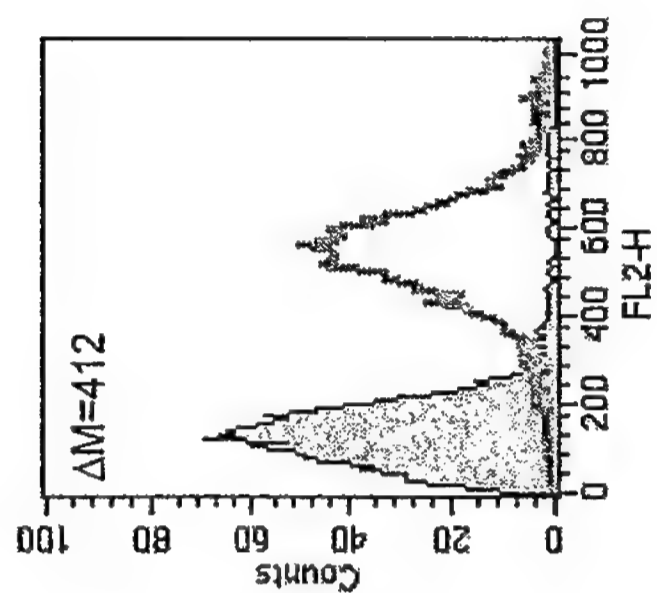
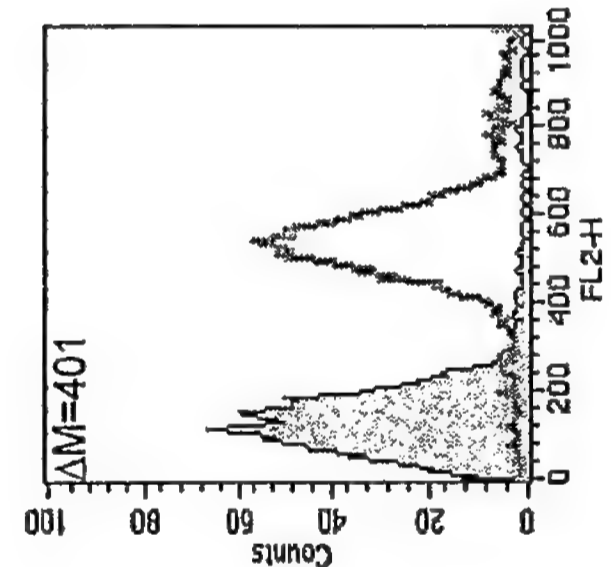
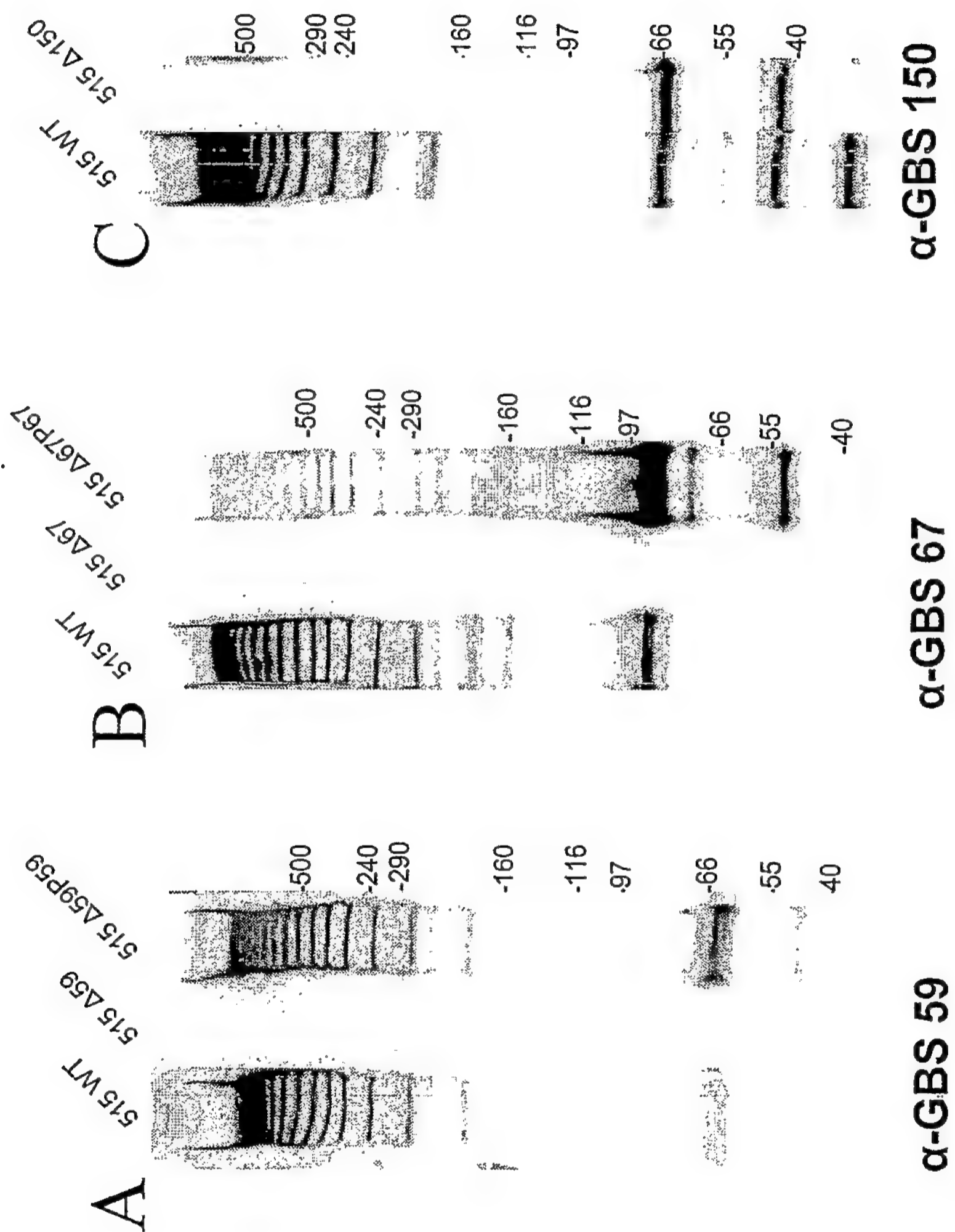


Figure 220



PCT/US05/27239 459/487

Figure 221

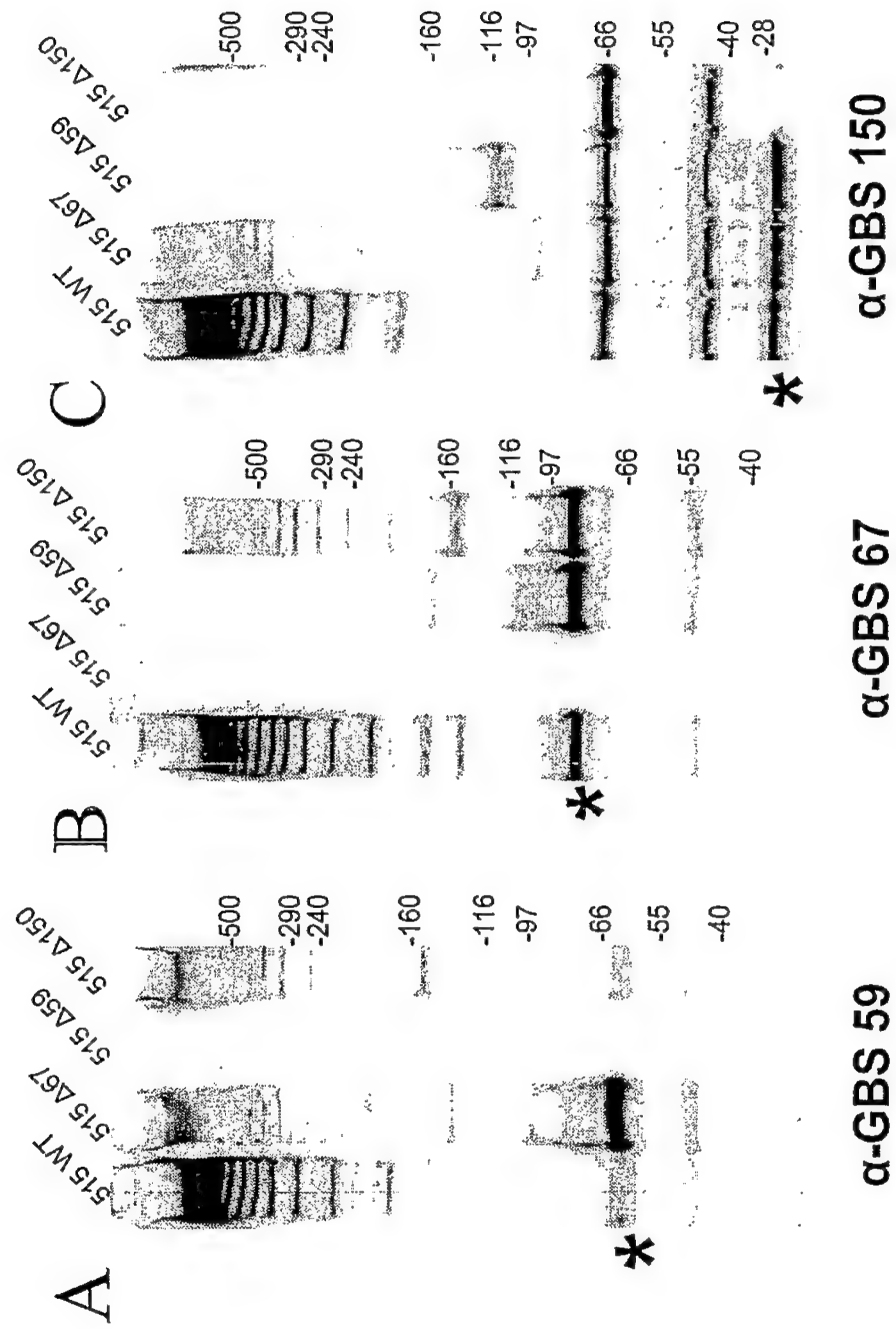
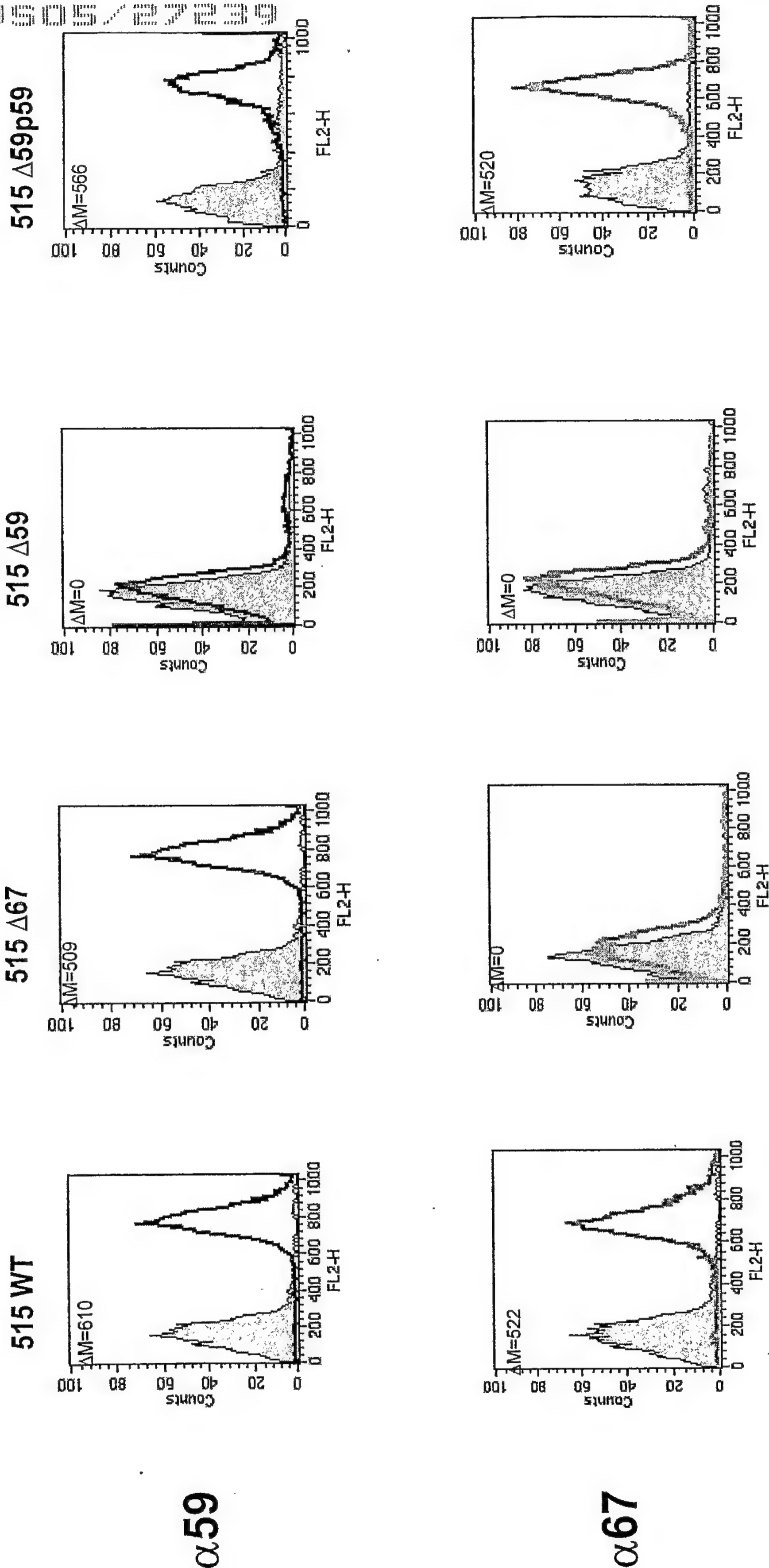
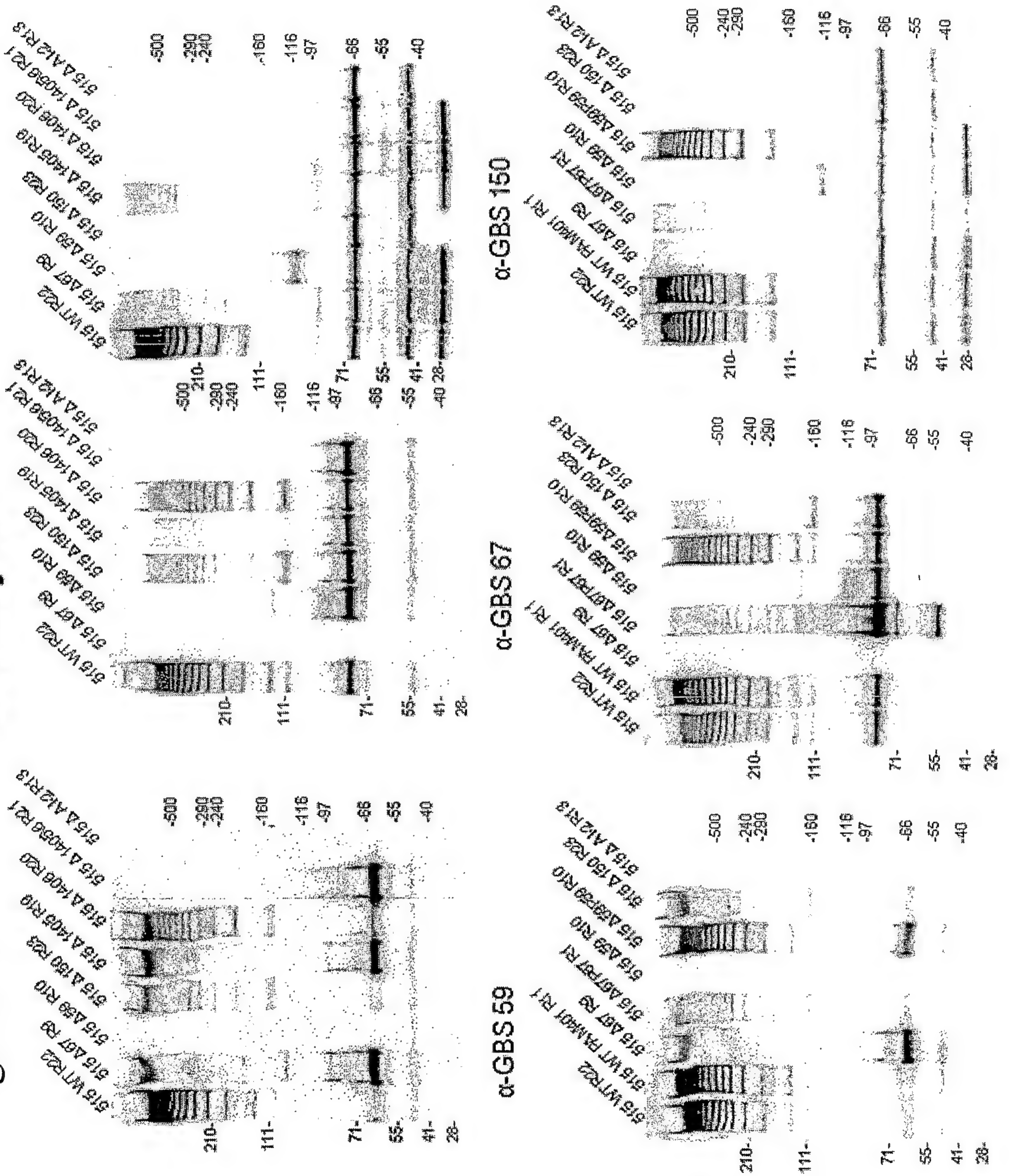


Figure 222



Summary WB

Figure 223



GBS strain % AA identity

7357b (Ib)	100
5518 (Ib)	100
5364 (V)	100
1999 (IV)	100
5408 (VIII)	98
coh31 (III)	98
d136c (III)	98
nem316 (III)	98

dk1 (Ia)	100
dk8 (Ia)	100
davis (Ia)	100
5551 (Ia)	100
2986 (Ia)	100
2110 (V)	100
2210 (IV)	100

18RS21 (II)	100
3050 (II)	100
2141 (II)	100
1998 (III)	100
2928 (VII)	99,9

2274 (IV)	99,9
2129 (Ib)	99,7
5401 (II)	99,8

GBS 59 allelic variants

cjb111 (V)
674 aa

75%

515 (Ia)
675 aa

48%

2603 (V)
705 aa

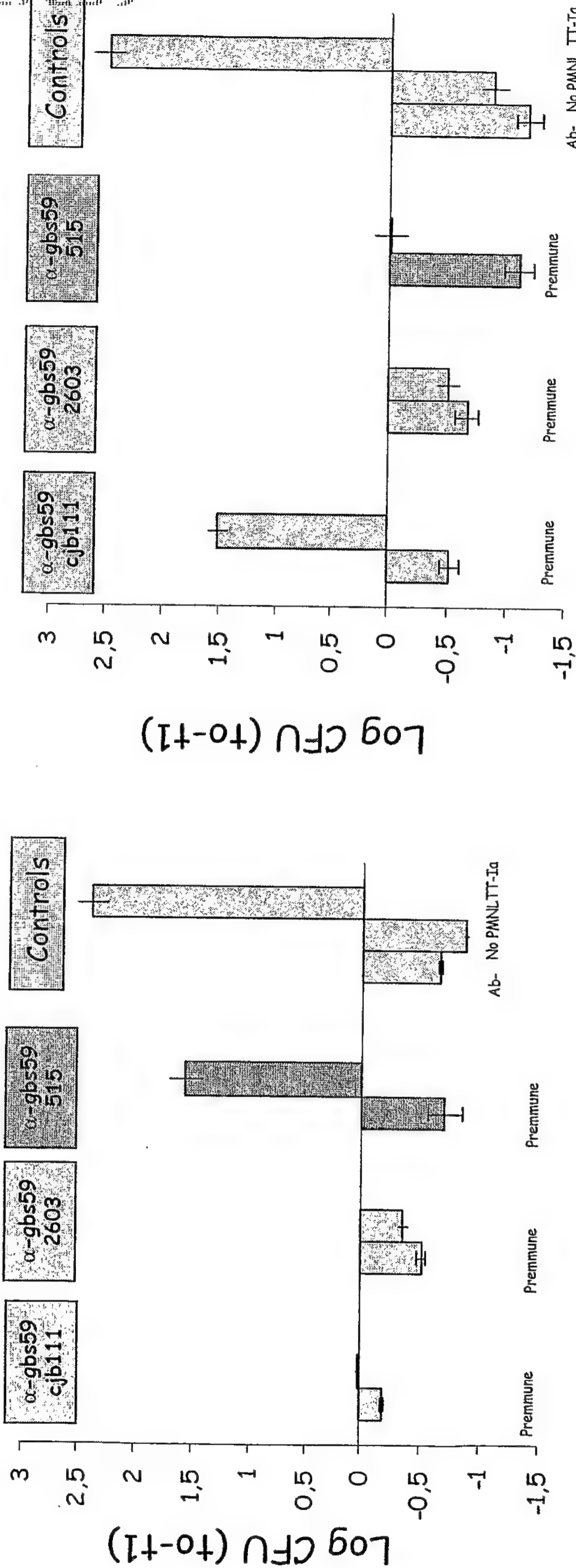
65%

H36b (Ib)
693 aa

Figure 224

Figure 225

GBS 59 is opsonic only against homologous strain



• 515 (Ia) GBS strain

• cjb111 (V) GBS strain

Figure 226 A

		GBS 59		
GBS strains	Type	PCR	FACS (a-cjb111)	FACS (a-2603)
DK1	Ia	+	565	
DK8		+	559	
Davis		+	577	
515		+	583	0
090		+	0	0
2986		+	443	
5551		+	524	
H36B	Ib	+	0	410
7357b-		+	596	
5518		+	190	
D136C	III	+	504	
COH31		+	505	
1998		+	59	510
18RS21	II	+	0	353
DK21		+	249	0
3050		+	0	570
5401		+	0	400
2141		+	0	371
CJB111	V	+	625	0
2603		+	0	73
5364		+	593	
2110		+	590	0
2274	IV	+	0	400
1999		+	594	
2210		+	636	
5408	VIII	+	537	
CJB110	NT	+	0	0
1169		+	227	0

		GBS 59		
GBS strains	Type	PCR	FACS (a-cjb111)	FACS (a-2603)
A909	Ia	-	22	0
2177	Ib	-	75	
COH1		-	0	
M732		-	0	
M781	III	-	17	
5376		-	60	
5435		-	55	
SMU071		-	0	
JM9130013	VIII	-	0	0

Figure 226 B

Figure 227 A

		FACS (D Mean)				
GBS strains	Type	GBS 80	GBS 104	GBS 67	GBS 322	GBS 59
DK1	Ia	0	0	478	153	565
DK8		0	0	475	213	559
Davis		0	0	430	86	577
515		0	0	409	227	583
090		0	0	0	0	0
A909		46	29	0	0	0
2986		0	0	397	0	443
5551		0	0	485	36	524
2177	Ib	477	355	66	323	0
H36B		0	0	444	105	410
7357b-		91	0	316	102	596
5518		31	0	162	0	190
COH1	III	305	226	0	130	0
D136C		40	40	406	460	504
COH31		0	0	273	479	505
M732		141	101	0	292	0
M781		111	136	0	224	0
1998		140	77	350	288	510
5376		165	156	0	76	0
5435		93	100	0	88	0
18RS21	II	0	0	103	471	353
DK21		0	0	331	342	249
3050		71	46	460	188	570
5401		75	28	618	135	400
2141		0	0	370	76	371
CJB111	V	365	236	481	58	625
2603		62	0	105	293	73
5364		454	281	394	463	593

2110		0	0	589	0	590
2274		123	62	484	161	400
1999	IV	0	389	453	55	594
2210		0	0	574	0	636
SMU071		556	393	74	170	0
JM9130013	VIII	587	436	72	133	0
5408		0	0	433	0	537
CJB110		0	0	245	587	0
1169	NT	0	0	443	213	227
D Mean > 200		6/37 (16%)	7/37 (19%)	24/37 (65%)	14/37 (38%)	24/37 (65%)

Figure 227B

Figure 228

		FACS (ΔMean)														Δmean		
GBS Strain	Type	GBS 80		GBS 104		GBS 322		GBS 67		GBS 67 _{H36B}		GBS 59 ₂₆₀₃		GBS 59 _{CJB111}		GBS 59 ₅₁₅		neg. control
		142-F		Mab		86		81										
cde-1	II	114	95	0	0	122	122	360	341	422	403	92	73	254	235	306	287	19
cde-2	IB	173	69	92	0	95	75	552	448	590	486	135	31	635	531	197	93	104
cde-3	II	566	508	360	302	85	60	364	306	433	375	111	53	448	390	310	252	58
cde-4	V	524	432	337	245	284	204	577	485	625	533	105	13	674	582	303	211	92
cde-5	II	140	0	0	0	462	300	487	297	563	373	175	0	373	183	440	250	190
cde-6	V	544	484	361	301	95	95	586	526	601	541	55	0	686	626	302	242	60
cde-7	III	155	116	44	5	134	118	95	56	138	99	74	35	92	53	91	52	39
cde-8	III	347	304	192	149	74	62	98	55	170	127	72	29	88	45	108	65	43
cde-9	II	89	65	0	0	226	191	390	366	504	480	181	157	317	293	410	386	24
cde-10	IA	46	24	0	0	152	152	494	472	531	509	43	21	16	0	48	26	22
cde-11	IA	17	0	0	0	295	135	569	550	569	550	47	28	467	448	648	629	19
cde-12	V	439	430	290	281	60	30	174	165	227	218	52	43	139	130	207	198	9
cde-13	IA	33	0	0	0	216	146	469	436	469	436	100	67	361	328	571	538	33
cde-14	III	78	68	10	0	213	191	50	40	85	75	38	28	69	59	67	57	10
cde-15	III	119	53	24	0	108	98	48	0	127	61	89	23	105	39	100	34	66
cde-16	V	363	335	177	149	310	270	70	42	127	99	48	20	130	102	128	100	28
cde-17	III	160	0	163	0	408	248	377	217	410	250	441	281	359	199	167	7	160
cde-18	III	49	28	0	0	239	218	34	13	36	15	16	0	49	28	56	35	21
cde-19	III	182	101	0	0	361	280	310	229	312	231	384	303	220	139	0	0	81
cde-20	V	348	304	203	159	380	336	166	122	211	167	114	70	232	188	128	84	44
cde-21	II	222	132	83	0	150	60	331	241	336	246	0	0	420	330	59	0	90
cde-22	IA	0	0	13	13	43	43	238	238	238	238	43	43	38	38	429	429	0
cde-22 (9-6-05)		23	0	34	0	110	20	310	220	320	230	113	23	117	27	344	254	90
cde-23	V	484	484	374	374	278	278	124	124	206	206	11	11	91	91	236	236	0
cde-24	V	137	52	0	0	333	248	90	5	110	25	110	25	120	35	70	0	85
cde-25	IA	0	0	0	0	351	190	530	370	565	405	495	335	442	282	625	465	160
cde-26	II	117	2	0	0	185	70	210	95	285	170	30	0	175	60	210	95	115
cde-27	III	323	95	34	0	498	270	346	118	406	178	424	196	314	86	64	0	228
cde-28	V	150	92	20	0	132	74	462	404	505	447	0	0	526	468	78	20	58
cde-29	IV	90	73	65	48	195	178	90	73	150	133	150	133	138	121	110	93	17
cde-30	V	390	187	336	133	348	145	229	26	244	41	113	0	268	65	223	20	203
cde-31	IA	22	0	68	0	306	182	368	244	386	262	126	2	248	124	426	302	124
cde-32	IA	45	0	12	0	260	175	190	105	205	120	30	0	100	15	185	100	85
cde-33	II	50	0	0	0	306	156	134	0	237	87	4	0	180	30	190	40	150
cde-34	III	152	60	47	0	342	250	44	0	74	0	27	0	102	8	48	0	92
cde-35	V	227	227	40	40	246	246	395	395	415	415	0	0	550	550	142	142	0
cde-36	IB	25	15	8	0	30	20	154	144	174	164	33	23	222	212	20	10	10
cde-37	III	168	53	61	0	361	246	82	0	133	18	83	0	132	17	75	0	115
cde-38	II	140	14	30	0	338	212	124	0	198	72	158	32	138	12	104	0	126
cde-39	II	126	0	0	0	316	148	466	298	514	346	438	270	184	16	34	0	168
cde-40	V	420	366	214	160	22	0	103	49	162	108	90	36	209	155	192	138	54
cde-41	II	146	31	15	0	380	265	330	215	425	310	140	25	280	165	315	200	115

Figure 229

Expected strain coverage

MIX GBS proteins

n. antigens FACS++	vaccine options	w/o 322					w/o 59+322		
		80+104+67+59+322	80+104+67+322	80+104+67+59	80+67+59	80+104+67	80+104+67	80+67	80+59
1	89%	89%	80%	80%	80%	79%	79%	79%	74%
2	74%	51%	71%	64%	24%	16%	16%	16%	16%
3	23%	14%	17%	16%	13%				

- GBS 322 but not GBS 59 is important to increase strain coverage
- GBS 59 probably could be useful to increase the vaccine strength

Assumption:

- Protein antigens that are highly accessible to antibodies confer 100% protection with suitable adjuvants

PCT/US05/27239

Figure 230

GBS 59 opsonophagocytic activity is comparable to that of the four-protein mix

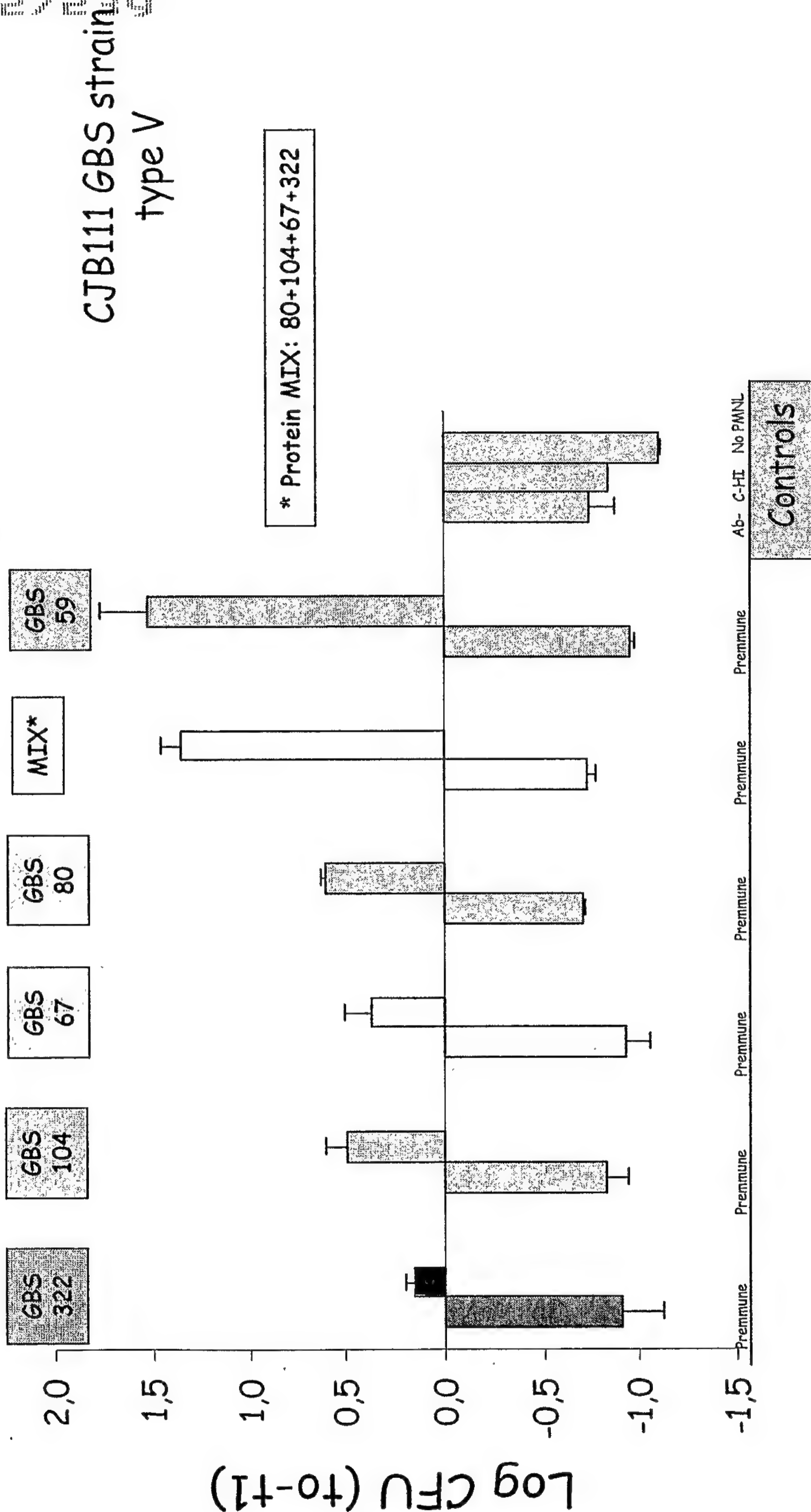


Figure 231

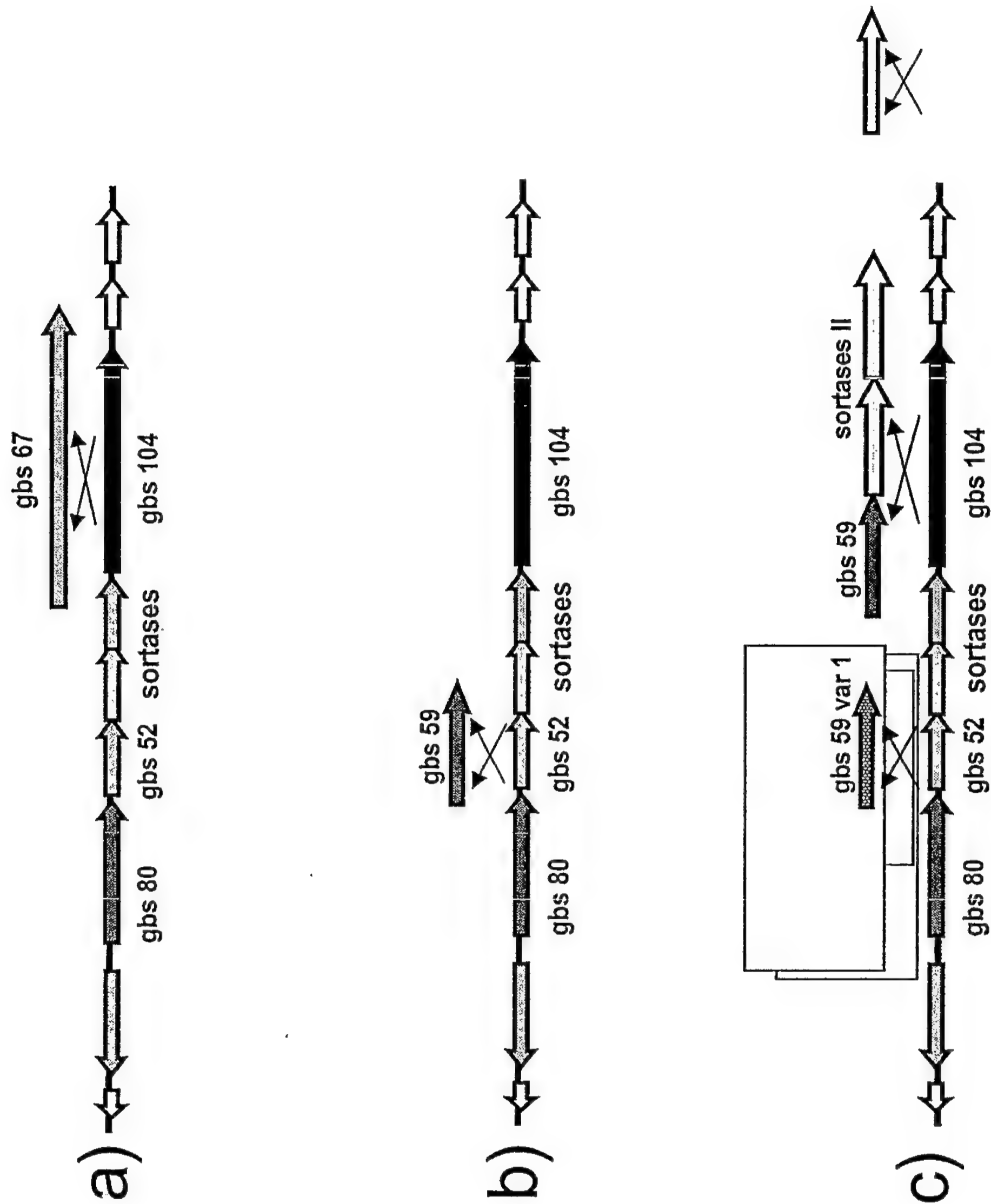
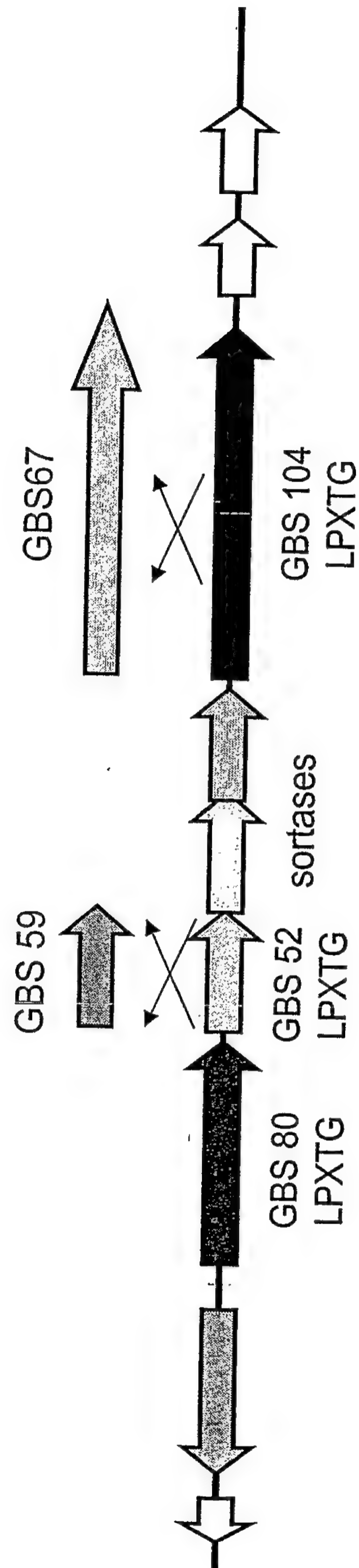


Figure 232



PCT/US05/27239 473/487

Figure 233

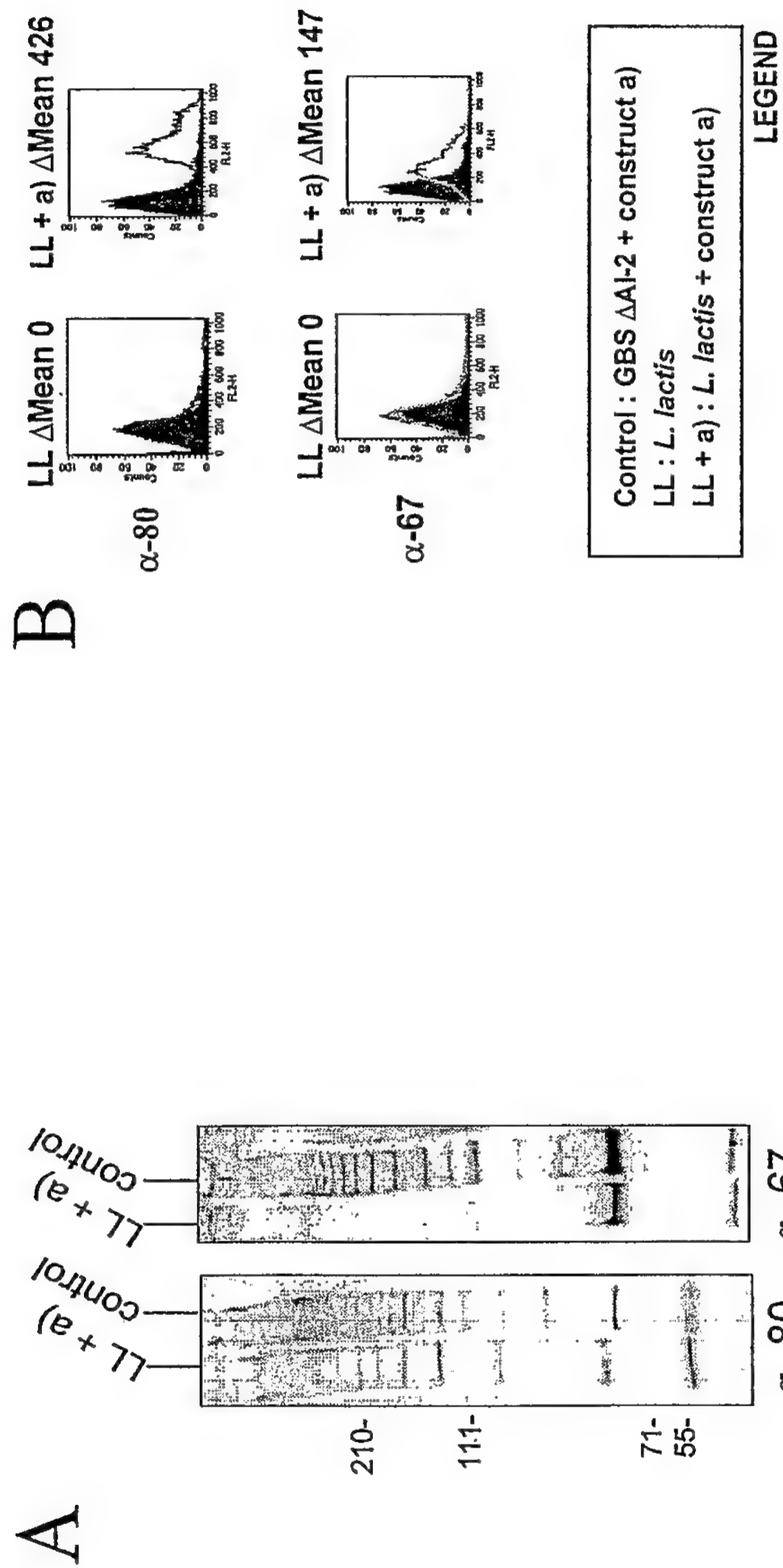
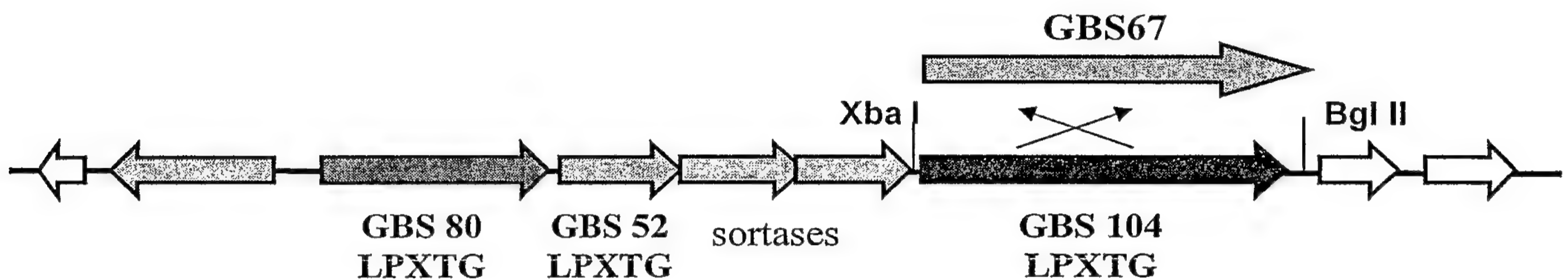


Figure 234 A

Introducing Heterologous Antigens into AI-1 pilus to Obtain Protection Across GBS Strains

1- Substitution of GBS 104 with GBS67 from Island II

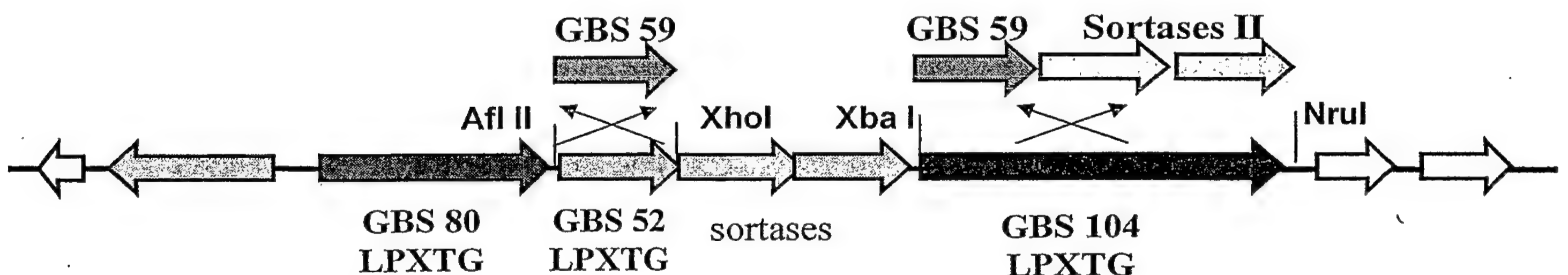


Oligo GBS67pAMXbafor AGTCAGTCTCTAGACGGCACAATAGGAGTTGTAAA

Oligo GBS67pAMBglrev CACCTGTCATAGATCTTAAGAATACTAAAGCGCATAA

2- Substitution of GBS52 or 104 with:

- a) GBS 59 alleles 515 or CJB
- b) GBS 59 allele CJB111 + sortases island II
- c) GBS 59 allele 515 + GBS 59 CJB111 + sortases island II



DETAILS:

a) Oligos to be used:

Oligo 59pAMAfIfor1 AGTCAGTCCTTAAGCCGCATATTATTAATCATGTTG (allele 515)

Oligo 59pAMAfIfor1 AGTCAGTCCTCGAGTTAACTTCCTCTGATTGACG (allele 515)

Oligo 59pAMAfIfor2 AGTCAGTCCTTAAGAAGGAGTGGTGCTGCGGTAA (allele CJB111)

Oligo 59pAMXhorev2 AGTCAGTCCTCGAGTTAAGCTTCCTCTGATTGACG (allele CJB111)

PCT/US05/27239 475/487

b) Oligos to be used:

Oligo GBS59XbaF CTAGTGATATATCTAGAGAAAAAG

Oligo Sort59NruR CTAGCTAGTCGCGACTTTTTCATTTTGGATTCCCTTTC

Figure 234 B

3- Substitution of GBS104 with a fusion of GBS322-GBS67 to include GBS 322 into AI-1

- a) Construct 1: GBS67 complete sequence included
- b) Construct 2: Only part of GBS 67 was included (*deleted bold region*)

DETAILS:

a) Construct 1:

Legend:

Pink GBS322

Black GBS67

Black Bold: fragment of GBS67 eliminated in construct 2

Green PK motifs

Yellow E motifs

Red LPXTC

> gbs67-515 + 322

MRKYQKFSKILTLSLFCLSQIPLNTNVLGESTVPENGAKGKLVVKKTDDQNKPLSKATFV
 LKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAPEGYKKTNQTWQVKVESNGKT
 TIQNSGDKNSTIGQNQEELDKQYPPTGIYEDTKESYKLEHVKGSPVNGKSEAKAVNPYSS
 EGEHIREIPEGTLKRISVGD LAHNKYKIELTVSGKTIVKPVDKQKPLETDTTWTARTVSEV
 KADLVKQDNKSSYTVKYGDTLSVISEAMSIDMNV LAKINNIADINLIYPETTLTVTYDQKSHIA
 TSMKIETPATNAAGOTTATVDLKTNOQSVADQKVS LNTISEGMTPEAATTIVSPMKTYSSAF
 ALKSKEVLAQEQAVSQAAANEQVSPAPVKSITSEVPAAKEEVKPTOTSVSQSTTVSPASVA
 AETPAPVAKVAPVRTVAAPRVASVKVYTPK VETGASPEHVSAPAVPVTTTSPATDSKLOAT
 EVKSPVVAQKAPTATPVAQPASTTNAAVAHPENAGLQPHVAAYKEKVASTYGVNEEFSTYRAC
 DRGDHGGKGLAVDFIVGTNOALGNKVAQYSTONMAANNISYVIWQOKFYSN
 INSIYGPANTWNAMPDRGGVTANHYDHYVHVSFNKDVVFVLDNSNS
 MNNDGPNFQRHNKAKKAAEALGTAVK DILGANS DNRVALVTYGS DIFDGRSVDVVKGFKE
 DDKYYGLQTKFTIQTENYSHKQLTNNAEEIIRIPTEAPKAKWGSTTNGLTPEQQKEYYL
 SKVGETFTMKAFMEADDILSQVNRNSQKIIVHVT DGVPTRSYAINNFKL GASYESQFEQM
 KKNGYLNKSNFLLTDKPDDIKMGESYFLFPLDSYQTQIISGNLQKLHYLDLNLNYPKGT
 IYRNGPVKEHGTPTKLYINSLKQKNYDIFNFGIDISGFRQVYNEEYKKNQDGT FQKLKEE

PCT/US05/27239 477/487

AFKLS DGEITELMRSFSSKPEYYTPIVTSADTSNNEILSKIQQQFETILTKENSIVNGTI
EDPMGDKINLQLGNGQILQPSDYTLQGNDGSVMKDG IATGGPNNDGGILKGVKLEYIGNK
LYVRGLNLGEGQKVTLTYDVKLDDSFISNKFYDTNGRTTLNPKSEDPNTLRDFPIPKIRD
VREYPTITIKNEKKLGEIEFIKVDKDNNKLLLKGATFELQEFNEDYKLYLPIKNNNSKVV
TGENGKISYKDLKDGKYQLIEAVSPEDYQKITNKPILTFEVVKGSIKNIIAVNKKQISEYH
EEGDKHLITNTHIPPKGIKTKGKGILSFILIGGAMMSIAGGIYWKRYKKSSDMSIKK
D

PCT/US05/27239 478/487

Figure 234 C

b) Construct 2:

>gbs67-515 deleted+ 322

MRKYQKFSKILTSLFCLSQIPLNTNVLGESTVPENGAKGKLVVKKTDQNKPLSKATFV
 LKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAPEGYKKTNQTWQVKVESNGKT
 TIQNSGDKNSTIGQSQEELDKQYPPTGIYEDTKESYKLEHVKGSPNGKSEAKAVNPYS
 SEGEHIREIPEGTLSEVVDLAHNKYKIELTVSGKTIVKPVDKQKPLETDTTW
 TARTVSEVKADLVKQDNKSSYTVKYGDTLSVISEAMSIDMNVLAKEINNIADINLIYPETTLTV
 TYDQKSHATATSMKIETPATNAAGQTTATVDLKTNOVSVADQKVSNTISEGMTPEAATT
 VSPMKTYSSAPALKSKEYLAQEQAVSQAAANEQVSPAPVKSTSEVFAAKEEVKPTQTS
 VSGSTTVSPASVAAETPAPVAKVAPVTVAPRYASVKVYTPKVVETGASPEHVSAPAVE
 VTTTSPATDSKLQATEVKSVFVAQKAPTATPYAQPASTTNAAVAHPENAGLOPHVAAYK
 EKVASTYGVNEFSYRAGDPGDHCKGLAVDFVGTNQALGNKYAQYSTQNMANNISYV
 WQOKFYSTNSIYGPANTWNAMPDRGGVTANHYDHVHVSEFNKGESYFLPLDSYQTQ
 IISGNLQKLHYLDLNLNYPKGTIYRNGPVKEHGTPTKLYINSLKQKNYDIFNFGIDISGFRQ
 VYNEEYKKNQDGTGFQKLKEEAFKLSDGEITELMRFSFSKPEYYTPIVTSADTSNNEILSKI
 QQQFETILTKENSIVNGTIEDPMGDKINLQLGNGQILQPSDYTLQGNDGSVMKDGIATGG
 PNNDGGILKGVKLEYIGNKLYVRGLNLGEGQKVTLTYDVKLDDSFISNKFYDTNGRTTLN
 PKSEDPNTLRDFPIPKIRDVREYPTITIKNEKKLGEIEFIKVDKDNNKLLLKGATFELQEFNE
 DYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLIEAVSPEDYQKITNKPILTFEVVKG
 IKNIIAVNKQISEYHEEGDKHLITNTHIPPKGIPKJGCKGILSFILIGGAMMSIAGGIYIWKRY
 KKSSDMSIKKD

Oligos to be used:**Oligo GBS67pAMXbafor (vedi operone)**

AGTCAGTCTCTAGACGGCACAAATAGGAGTTGTAA

XbaI

Oligo GBS67soe1rev

GGACCGTGGTATCTCTTTCTAACGGCTTTTGTGTGTCCT

Oligo GBS322soe2for

GACAAACAAAAGCCGTTAGAAACAGATACGACCTGGACAG

Oligo GBS322soe2rev1 (per costrutto non deleto in 67)

GAGTACGAAGACAACATCTTTCTTAAATGATACCTGAACC

Oligo GBS322soe2rev2 (per costrutto deleto in 67)

TAAAAAGTAACTCTCCCCCTTTCTTAAATGATACCTGAACC

PCT/US05/27239 479/487

Oligo fine67soe3for1 (per costrutto non deleto in 67)

GACGTATCATTTAACAAA GATGTTGTCTTCGTA CT CGAT

Oligo fine67soe3for2 (per costrutto non deleto in 67)

GACGTATCATTTAACAAA GGGGAGAGTTACTTTTTATTTC

Oligo GBS67pAMBglrev (vedi operone)

CACCTGTCATAGATCTTAAGAATACTAAAGCGCATAA

BgIII

PCT/US05/27239 480/487

Figure 234 D

PCR Soe1: GBS67pAMXbafor + GBS67soe1rev 727 bp

PCR Soe2 non del: GBS322soe2for + GBS322soe2rev1 1260 bp

PCR Soe2 del: GBS322soe2for + GBS322soe2rev2 1260 bp

PCR Soe3 non del: fine67soe3for1 + GBS67pAMBglrev 2061 bp

PCR Soe3 del: fine67soe3for2 + GBS67pAMBglrev 1419 bp

PCR Soe4 non del. PCR25: GBS67pAMXbafor + GBS67pAMBglrev 4000 bp

Substrato PCRSoe1, 2, 3 non del

PCR Soe4 del, PCR26: GBS67pAMXbafor + GBS67pAMBglrev 3312 bp

Substrato PCRSoe1, 2, 3 del

4- Substitution of GBS 52 with a fusion of GBS322-GBS52 to include GBS 322 into AI-1

(same legend as for GBS67 derivatives)

a) Construct 1: GBS52 complete sequence included

b) Construct 2: Only part of GBS 52 was included (*deleted bold region*)**DETAILS:**

a) Construct 1:

>GBS322-52 senza delezione di 52 (B) PCR 24

MKMNKKVLLTSTMAASLLSVASVQAQETDITWTARTVSEVKADLVKQDNK
 SSYTVKYGDITLSVISEAMSIDMNVLA KINNIADINLIYPETITLTVTYDQK
 SLTATSMKIETPATNAAGQTTATVDIKTNQVSVADQKVSLNTISEGMTPE
 AATTIVSPMKFYSSAPALKSKEVLAGEQAVSQAAANEQVSPA
 RVKSITSEVPAAKEEVKPTQTSVSQSTTVSPASVAAETPAPVAKVAPVRTVAAPRVAS
 VKVVTRPKVETGASPEHVSAPAVPVTTTSPATDSKLQATEVKSPVPAQKAF
 IATPVAQPASTTNAAVAHPENAGLOPHVAAYKEKVASTYGVNEFSTYRAG
 DPGDHKGKGLAVDFIVGTNOALGNKVAQYSTONMAANNISYVIWQOKFYSN
 TNSIYGPANTWNAMPDRGGVTANHYDHVHVSFNK HQLTIVHLEARDIDRPNPQL
 EIAPKEGTPIEGVLYQLYQLKSTEDGDLLAHWNSLTITELKKQAQQVFEA
 TTNQQGKATFNQLPDGIYYGLAVKAGEKNRNVSAFLVDLSEDKVIYPKII
 WSTGELDLLKVGVDGDTKKPLAGVVFELYEKNGRTPIRVKNGVHSQDIDA
 AKHLETDSGHIRISGLIHGDYVLKEIETQSGYQIGQAETA VTIEKSKTV

WO 2006/078318

PCT/US2005/027239

PCT/US05/27239 481/487

TVTIENKKVPTPKVPSRGGL  QQAMALVIIGGILIALALRLLSKH
RKHQNKD

PCT/US05/27239

482/487

Figure 234 E**b) Construct 2:**

>GBS322-52 (A) PCR 23

MKMNKKVLLTSTMAASLLSVASVQAQETD TTWTARTVSEVKADLYKODNK
 SSYTVKYGDTLSVISEAMSIDMNV LAKINNIADINLIYPETTLTVTYDOK
 SHTATSMKIETPATNAAGCOTTATYDLKTNQVSVADOKVSLNTISEGMTPE
 AATTIVSEFMKTYSSAPALKSKEVLAQEQAVSQAAANEQVSPA
 PVKGITSEVPAAKEEVKPTQTSVSGSTTVSPASVAAETPAPVAKVAPVRTVAAPRVAS
 VKWVTPK VETGASPEHVSAPAVPVTTTSPATDSKLQATEVKSPVAQKAF
 IATPVAQPASTTNAAHPENAGLOPHVAAAYKEKVASTYGVNEFSTYRAG
 DPQDHGKGLAVDFMG TNOALCNKVAQYSTONMAANNISYVWQOKFYSN
 TNSLYGPANTWNAMPDRGGVTANHYDHVHVSEFNK
 QGKATFNQLPDGIYYGLAVKAGEKNRNVSAFLVDLSEDKVIYPKII
 WSTGELDLLKVGVDGDTKKPLAGVVFELYEKNGRTPIRVKNGVHSQDIDA
 AKHLETSSGHIRISGLIHGDYVLKEIETQSGYQIGQAETAVTIEKSKTV
 TVTIENKKVPTPKVPSRGGLEKTCGQQAMALVIIGGILIALALRLLSKH
 RKHQNKD

Oligos to be used:

Oligo 322Aflfor1

AGTCAGTCCTTAAGGATATTATAGTCTCGGACTA

Afl II

Oligo 52 soe1 forA

CAAGCTATCATTAAACAAA CAAGGAAAGGCTACATTAAACG

Oligo 52 soe1 forB

TTCAAGCTATCATTAAACAAA CATCAGTTGACGATTGTTTCATC

Oligo52 soe1revA

AAATGTAGCCTTTCCTTGTTTGTTAAATGATACCTGAACG

Oligo52 soe1revB

AACAATCGTCAACTGATGTTTGTTAAATGATACCTGAACG

Oligo 52Xhorev

AAGACCTCCTCGAGATGGCACTT

PCT/US05/27239

483/487

Xho I

PCR Soe1A: Oligo 322Aflfor1+ Oligo 52 soe1 revA 1370 bp

PCR Soe2A: Oligo52 soe1forA + Oligo 52Xhorev 520 bp

PCR Soe3A: Oligo 322Aflfor1 + Oligo 52Xhorev 1846 bp (con PCR Soe1A + PCR Soe2A)
(PCR23)

PCR Soe1B: Oligo 322Aflfor1+ Oligo 52 soe1 revB 1370 bp

PCR Soe2B: Oligo52 soe2forB + Oligo 52Xhorev 742 bp

PCR Soe3B: Oligo 322Aflfor1 + Oligo 52Xhorev 2068 bp (con PCR Soe1B + PCR Soe2B)
(PCR 24)

484/487

Figure 235

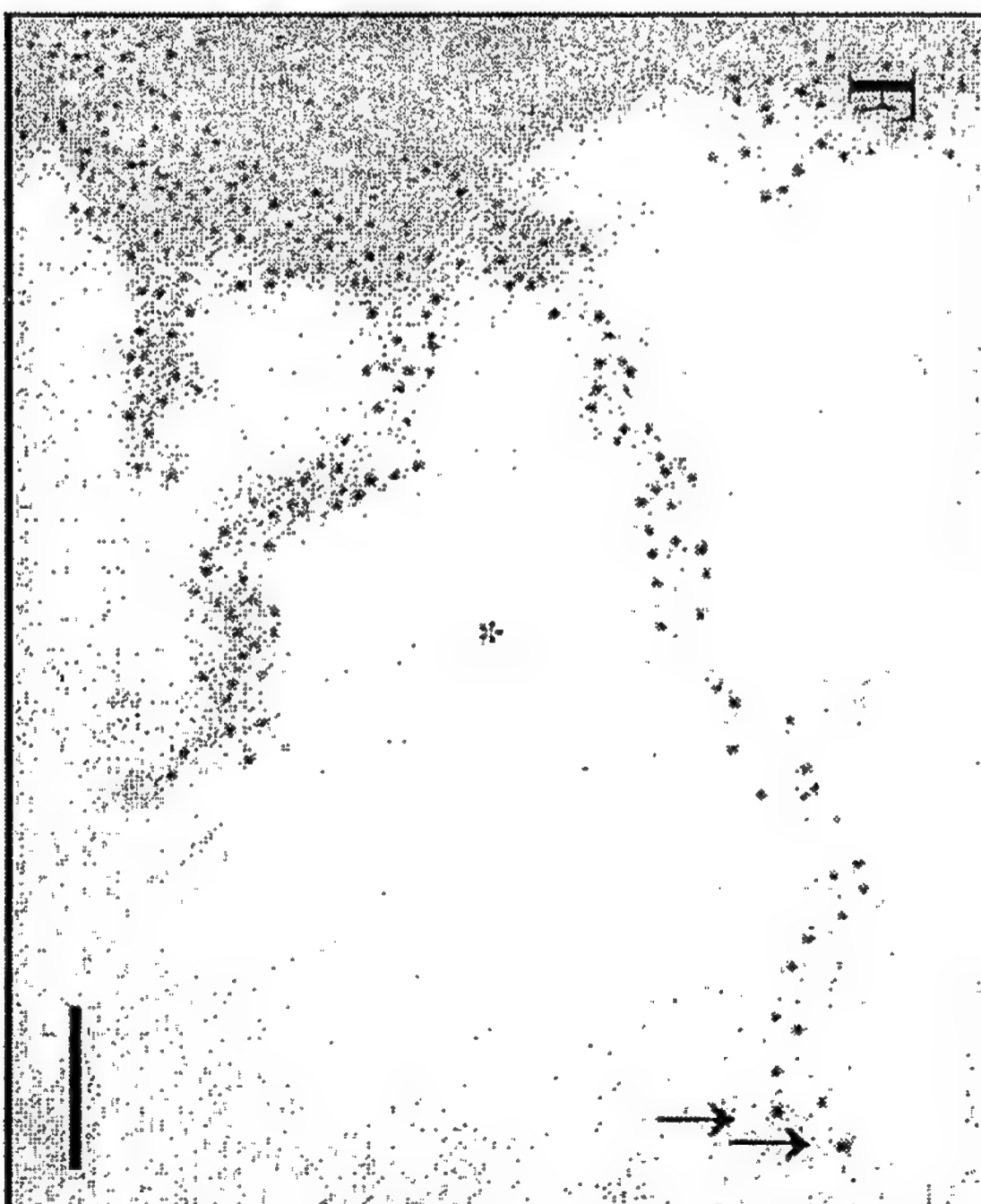


Figure 236



Strain variability - GBS67: 2 alleles

1 MRKYQKPSKILTLFLCLISQIPLNTNVLGESTVPENGAKGLVVKTTDDQ 50
|||||
1 NVLGESTVPENGAKGLVVKTTDDQ 25
51 NKPLSKATFVLKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAP 100
|||||
26 NKPLSKATFVLKPTSHSESKEKVTTVTGEATFDNLTPGDYTLSEETAP 75
101 EGYKKTQWQVKVESNGKTTIQNSGDKNSTIGQNQEELDKQYPPTGIYE 150
|||||
76 EGYKKTQWQVKVESNGKTTIQNSDDKKSIIIEQRQEELDKQYPLTGAYE 125
151 DTKESYKLEHVKGSPNGKSEAKAVNPYSSEGEHIREIPEGTLSKRISSEV 200
|||||
126 DTKESYNLEHVKNIPNGKLEAKAVNPYSSEGEHIREIQEGTLSKRISSEV 175
201 GDLAHNYKIELTVSGKTVKPVDKQKPLDWVFVLDNSNMNNDGPNFOR 250
|| |||||
176 NDLDHNYKIELTVSGKSIKTINKDEPLDWVFVLDNSNMKNNGKN... 222
251 HNKAKKAAEALGTAVKIDILGANSNDRVALVTYGSDFDGRSVDVVKGEKE 300
|||||
223 .NKAKKAGEAVETIIKDVLGANVENRAALVTYGSDFDGRTVKVIKGEKE 271
301 DDKYGLQTKFTIQENYSHKQLTNNAEEIIKRIPTAPKAKWGSTTNGL 350
| |||||
272 .DPYYGLETSFTVQTFNDYSYKFTNIAADIKKIPKEAPEAKWGGTSLGL 320
351 TPEQQKEYYLSKVGETFTMKAFMEADDLISQVNRNSQKIIVHVTDDGVPT 400
|||...||
321 TPEKKREYDLSKVGETFTMKAFMEADTLSSIQRSRKIIVHLTDGVPT 370
401 SYAINNFKLGASYESQEQMKKNGYLNKSNFLLTDKEDIKNGESYFLF 450
|||||. |..| |||. |. |||. |. : || || |||||
371 SYAINSFVKGSTYANQFERIKEKGILDKNYFIITDDPEKIKNGESYFLF 420

Differences
between strains
2603 and H36B
(AA not matching/AA
total and % of homology)

114 / 828 (87,1%)

451 PLDSYQTQIISGNLQKLHVLDLNLNYPKGTIYRNGPVKEHGTPTKLYINS 500
|||||
421 PLDSYQTQIISGNLQKLHVLDLNLNYPKGTIYRNGPVREHGTPTKLYINS 470
501 LKQKNYDIENFGIDISGRQVYNEEYKKNQDGTFOKLKEEAFKLSGDGEIT 550
|||||
471 LKQKNYDIENFGIDISGRQVYNEEYKKNQDGTFOKLKEEAFKLSGDGEIT 520
551 ELMRSFSSKPEYYTPIVTSADTSNNEILSKIQQFFETILTKEINSIVNGTI 600
||| |||||
521 ELMRSFSSKPEYYTPIVTSADSVNNEILSKIQQFFETILTKEINSIVNGTI 570
601 EDPMGDKINLQNLGNGQTLQPSDYTLQNGDSVMKDGATGGPNNDGGILK 650
|||||
571 EDPMGDKINLHNLGNGQTLQPSDYTLQNGDSIMKDSIATGGPNNDGGILK 620
651 GVKLEYIGNKLYVRGLNLGEGQKVTLTYDVKLDSDSFISNKFYDTNGRTTL 700
|||||
621 GVKLEYIGNKLYVRGLNLGEGQKVTLTYDVKLDSDSFISNKFYDTNGRTTL 670
701 NPKSEDPNTLRDFPIPKIRDVREYPTITIKNEKKLGEIEFIVDKDNKL 750
|||||
671 NPKSEEPDTLRDFPIPKIRDVREYPTITIKNEKKLGEIEFIVDKDNKL 720
751 LLKGATFELQEFNEDYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLI 800
|||||
721 LLKGATFELQEFNEDYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLI 770
801 EAVSPEDYQKITNKPILTFEVVKSGSIKNIIAVNKQISEYHEEGDKHLITN 850
|||||
771 EAVSPKDYQKITNKPILTFEVVKSGSIQNI IAVNKQISEYHEEGDKHLITN 820
851 THIPPKGIIPMTGGKGILSFILIGGAMMSIAGGIYIWKRYKKSSDMSIKK 900
|||||
821 THIPPKGI..... 828

Figure 237

Strain variability - GBS67 Allele I (2603)

Strain	Differences in comparison with 2603 (% of homology)
2603	-
18RS21	1/833 (99.9%)
CJB111	14/833 (98.3%)
515	2/833(99.8%)

Figure 238

487/487

Strain variability - GBS67 Allele II (H36b)

Strain	Differences in comparison with H36b (% of homology)	FACS (α -67 from 2603)
H36B	-	444
1169	10/823 (98.8%)	443
090	9/316 Stop codon (8G to 7G)	0
CJB110	11/824 (98.7%)	245

Figure 239

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
27 July 2006 (27.07.2006)

PCT

(10) International Publication Number
WO 2006/078318 A3

(51) International Patent Classification:
A61K 39/02 (2006.01)

(21) International Application Number:
PCT/US2005/027239

(22) International Filing Date: 29 July 2005 (29.07.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/592,805	29 July 2004 (29.07.2004)	US
60/609,833	13 September 2004 (13.09.2004)	US
60/616,833	8 October 2004 (08.10.2004)	US
60/633,418	7 December 2004 (07.12.2004)	US
60/640,069	30 December 2004 (30.12.2004)	US
60/660,321	11 March 2005 (11.03.2005)	US
60/673,754	22 April 2005 (22.04.2005)	US
60/693,001	21 June 2005 (21.06.2005)	US
60/695,453	1 July 2005 (01.07.2005)	US
60/697,643	11 July 2005 (11.07.2005)	US

(71) Applicant (for all designated States except US): **NOVARTIS VACCINES AND DIAGNOSTICS INC.** [US/US]; 4560 Horton Street, Emeryville, CA 9460-2916 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **TELFORD, John, L.** [IT/IT]; Chiron Vaccines, 1, Via Fiorentina Siena, I-Siena (IT). **GRANDI, Guido** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **LAUER, Peter** [US/US]; 1438 Milvia Street, Berkeley, CA 94709-1917 (US). **MORA, Marirosa** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **ROS, Immaculada, Margarit, Y.** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **MAIONE, Domenico** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **BENSI, Guiliano** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina,

I-53100 Siena (IT). **RINAUDO, Daniela** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **MASIGNANI, Vega** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **BAROCCHI, Michelle** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT). **RAPPULOI, Rino** [IT/IT]; CHIRON VACCINES, 1, Via Fiorentina, I-53100 Siena (IT).

(74) Agent: **HALE, Rebecca, M.**; Novartis Vaccines and Diagnostics Inc., P.O. Box 8097, Emeryville, CA 94662-8097 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:
30 October 2008

(54) Title: IMMUNOGENIC COMPOSITIONS FOR GRAM POSITIVE BACTERIA SUCH AS STREPTOCOCCUS AGALACTIAE

(57) Abstract: The invention relates to the identification of a new adhesin islands within the genomes of several Group A and Group B Streptococcus serotypes and isolates. The adhesin islands are thought to encode surface proteins which are important in the bacteria's virulence. Thus, the adhesin island proteins of the invention may be used in immunogenic compositions for prophylactic or therapeutic immunization against GAS or GBS infection. For example, the invention may include an immunogenic composition comprising one or more of the discovered adhesin island proteins.



WO 2006/078318 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/27239

A. CLASSIFICATION OF SUBJECT MATTER

IPC: A61K 39/02(2006.01)

USPC: 424/190.1

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 424/190.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
MEDLINE, BIOSIS, HCAPLUS, EMBASE, DERWENT, PUBLISHED APPLICATIONS AND ISSUED PATENTS.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/34771 A2 (TELFORD et al) 02 May 2002 (02.05.2002), see pages 1411 and 3057. (only the relevant pages provided)	1-7 and 17-24
X	LARSSON et al. Protection against experimental infection with group B streptococcus by immunization with a bivalent protein vaccine. Vaccine. February 1999, Vol. 17, No. 5, pages 454-458.	1-7 and 17-24

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

21 May 2008 (21.05.2008)

Date of mailing of the international search report

25 AUG 2008

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-3201

Authorized officer

PADMA v. BASKAR

Telephone No. 571-272-1600

J. Roberts for

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/27239

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.: 1-7 and 17-24
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

- Remark on Protest**
- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/27239

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

1. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim 1 -7 (in part) drawn to an immunogenic composition comprising a purified Group B Streptococcus adhesion island polypeptide.

Further species election to one composition comprising GBS AI -1 or GBS AI -2 required (see paragraph # 3).

Group II, claims 8-16 (in part) drawn to an immunogenic composition comprising a purified gram positive adhesion island polypeptide.

Further species election to one composition comprising one bacteria and one GAS AI -1 ,GAS AI -2,GAS AI -3 and GAS AI -4 required (see paragraph # 3).

Group III, claims 17-24 (in part) drawn to an immunogenic composition comprising a first and second purified Group B Streptococcus adhesion island polypeptide.

Further species election to one combination of first and second polypeptide (see paragraph # 3).

Group IV, claims 25-34 (in part) drawn to an immunogenic composition comprising a first and second gram positive GAS AI -adhesion island polypeptide.

Further species election to one combination of first and second polypeptide (see paragraph # 3).

Group V, claims 35-39 and 40 (in part) drawn to a modified gram positive bacterium and a method of manufacturing adhesion island antigen

Further species election to one modified gram positive bacterium required (see paragraph # 3).

Group I is directed to an immunogenic composition comprising polypeptide GBS AI -1 or GBS AI -2 whereas Group II is drawn to immunogenic composition comprising gram positive bacterial adhesion polypeptides GAS AI -1 , GAS AI -2 , GAS AI -3 and GAS AI -4 . These inventions are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1 because these two compositions do not share a common structure ,property and function as group I contains GBS polypeptide where as group II comprises GAS polypeptides . Group III and Group IV are also drawn to compositions as group III comprises combination of two polypeptides from GBS that shares no common structure ,property and function with Group IV as it comprises GAS polypeptide and thus do not share a single inventive concept. Thus these inventions are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1 Group V is drawn to a modified bacterium from GBS , GAS and non-pathogenic gram positive bacterium comprising expressing polypeptide GBS- AI -1or GBS-AI-2 and not share a single inventive concept from other four groups as the composition contains polypeptides which does not share a common structure, property and function.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US05/27239

2. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

3 Group I species: GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524 or GBS AI -2

Group II species: GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4.

Group III species: Any combination of first and second polypeptide from GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2.

Group IV species: Any combination of first and second polypeptide from GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4

Group V species: Modified gram-positive bacterium or non pathogenic bacterium expressing GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2, GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4

The inventions listed as Groups 1-5 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The technical feature of linking groups appears to be that they are all related to immunogenic compositions comprising adhesion peptides methods of making adhesion peptide.

However, Beckmann et al Infection and Immunity, June 2002, p. 2869-2876, Vol. 70, No. 6 disclose an immunogenic composition comprising adhesion oligomeric polypeptide (see page 2871, left column last paragraph through right column and figure 3) As this polypeptide binds to fibrinogen it is an adhesion immunogen. Therefore, the technical feature of linking groups 1-5 does not constitute a special technical feature as defined by PCT Rule 13.2, as it does not define a contribution over the prior art and hence unity of invention is lacking.

The special technical feature of Groups 1-5 is considered to be immunogenic compositions comprising polypeptides that share no common structure, property and function and thus do not share the same or a corresponding technical feature.

Accordingly, Groups 1-5 are not so linked by the same or a corresponding special technical feature as to form a single general inventive concept.

The claimed species GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2; GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4 have no common structure and thus are not linked by the same or a corresponding special technical feature so as to form a single general inventive concept under Rule 13.1. Hence, unity is lacking among species.